DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

HEARINGS

BEFORE THE

JOINT COMMITTEE ON ATOMIC ENERGY
CONGRESS OF THE UNITED STATES

EIGHTY-FOURTH CONGRESS

FIRST SESSION

ON

DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

PART 3 OF THREE PARTS

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DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

MONDAY, FEBRUARY 28, 1955

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The Joint Committee met at 2 p. m., pursuant to call, in room P–63, the Capitol, Senator Clinton P. Anderson (chairman of the Joint Committee), presiding.

Present: Senators Anderson, Gore, Hickenlooper, and Bricker; Representatives Van Zandt, Durham, Price, and Cole.

Present also: Corbin C. Allardice, executive director, George Norris, Jr., counsel to the Joint Committee, and Walter A. Hamilton of the professional staff of the Joint Committee.

Chairman ANDERSON. The committee will be in order. We will resume the hearings that were adjourned for a while.

The first witness this afternoon will be Clyde Ellis.

Mr. Ellis, will you supply for the record your name and your position?

STATEMENT OF CLYDE T. ELLIS, GENERAL MANAGER, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. ELLIS. My name is Clyde T. Ellis. I am general manager of the National Rural Electric Cooperative Association, which is the service organization of the rural electric systems of the United States, representing about 91 percent of all of the rural electric systems, and serving about 3½ million farm families with electricity throughout the United States, including Alaska.

Mr. Chairman and gentlemen, this is my third appearance before this committee, and it is my first appearance since the passage of the Atomic Energy Act of 1954. I appreciate the opportunity of appearing before the committee again. This is my first appearance where I am guided by official policy of the national organization of the rural electric systems.

We have just completed our 13th national annual meeting in Atlantic City, and at this meeting three of our committees spent considerable time working up a statement of atomic-power policy to present to the full membership for their consideration. These committees, our atomic-energy committee, our power and generation committee, and our resolutions committee, worked long and hard to develop this statement. This statement was then presented to the membership at the meeting. They had it in their hands more than 24 hours before voting on it. They approved it unanimously. Since it

is rather long, I have included it as exhibit No. 1, and will refer to it from time to time. This statement of atomic-power policy is just one example of the increasing interest of our people in the atomic-power program.

I would like to present my general statement and then call on other members of our staff to supplement it. I would, if it meets with the approval of the committee, like to call on Dr. Clay L. Cochran, our staff economist, to discuss the problem of rapid tax amortization as related to the Duquesne Light Co. atomic powerplant, and Mr. Charles Fain, our legislative assistant and a lawyer, to discuss certain patent problems as we see them.

Chairman ANDERSON. That will be all right, and in addition we will add these resolutions at the end of your statement, and if there are other exhibits maybe we can pick them up at that time.

(The information referred to will be found on p. 464.)

Mr. ELLIS. Thank you, Mr. Chairman.

I think the members of the committee will be interested in hearing about some of the things the rural electric systems are doing in an effort to protect and further their interests in the atomic-power program. We realize the passage of the Atomic Energy Act of 1954 affords us new opportunities in this field. At the same time we are aware of the fact that further legislation is needed to improve this act to protect the interests of the rural electric systems and provide them with a real opportunity to participate in the atomic energy program. In order to take advantage of the limited opportunities offered by the act, our president, Jack Smith, appointed an NRECA atomic-energy committee on August 30, 1954, shortly after passage of the 1954 Act. Our committee is composed mainly of representatives of the rural electric systems from high cost power areas, such as Vermont, Iowa, Minnesota, Wisconsin, et cetera. There are also other representatives of the rural electric systems on the committee from New Mexico, Colorado, and Texas, and our president, Jack Smith, who is a manager of a cooperative in Virginia. Two of our staff are members of this committee, myself and Bob Kabat, who serves as secretary. Four of our committee members are managers of generation and transmission systems, and one is manager of the Colorado State association of REA cooperatives. The chairman, Mr. Gordon Loveless, is a dairy farmer from East Montpelier, Vt., and is the director on the NRECA board from Vermont and also a member of the Vermont Senate. This committee is truly representative of the interests of the rural electric systems in the field of atomic power.

This is a working committee, and I think the following excerpt from the statement, sent by our President when he appointed the committee, will substantiate this. I quote from his letter, dated August 30, to the members of the committee. [Reading:]

> The field into which you are moving is so complex, so walled about by security restrictions, so lush for exploitation by great corporate interests that I do not expect us to achieve any significant goals without considerable effort.

This committtee certainly has put forth considerable effort. They have met twice in Washington at their own expense, once in September when they met with the General Manager of the AEC and once again in October when they met with the Chairman, Admiral Strauss.

They also held several meetings in Atlantic City both prior to and during our annual meeting. They have attempted to explore ways the rural electric systems can more actively participate in the atomic power program, and also to assist in the formulation of atomic power policy for the Association. Their job has been hard and at times disappointing because we have not made any real gains in being able to participate in the AEC program.

NRECA study group: We have realized for some time that, to really study what is going on in the field of atomic power and to make this technical information available to our systems within the limitations of security requirements, we would have to get into the industrial participation program. We held several preliminary meetings with staff personnel of the Reactor Development Division of AEC, and in most of these meetings we were overwhelmed by the AEC's requirements that a study group must agree to spend at least $100,000 a year on its study and also must have people with advanced technical qualifications to participate in the study. We, of course, were well aware that we could not meet these conditions. But after several conferences at the AEC we were told that we could go ahead and submit a proposal for the consideration of the Commission, a proposal considerably different than those submitted previously by other groups. We submitted this proposal on September 15, 1954, and we were advised on January 12, 1955, that it had been approved by the Commission.

I wish later to discuss our proposed study group in some detail, but I thought you might be interested in the following paragraph from our proposal to the AEC which states the objectives of the group:

1. (To) Study the management and economic aspects of the application of nuclear power for the specialized needs of the rural electric systems. This would include a study of the rural electric systems' method of financing (loans from the Rural Electrification Administration which are repaid over 35 years at 2 percent interest) and their type of nonprofit operation as applied to the nuclear power program.
2. (To) Study the engineering practicability of various nuclear power reactors in view of the rural electric systems' specialized wholesale power needs and problems. This would include a study of the reactors to be constructed and operated in the AEC's 5-year reactor research and development program, the proposed Army package power reactor, and any other experimental power reactors which may be designed or built within the AEC program or the industrial participation program.
3. (To) Study and make recommendations to the Atomic Energy Commission concerning the desirability and feasibility of the location along the lines of a rural electric system or systems of a demonstration plant or plants which may be constructed under the Atomic Energy Act of 1954.

These are high objectives, and I would like to comment a little later on whether or not we think we will be able to achieve them. We will make every effort to do so.

NRECA annual meeting: The atmosphere of the atom dominated our recent annual meeting in Atlantic City, attended by over 3,800 rural electric leaders from pretty well all over the United States. One of the distinguished members of your great committee, Senator Gore, made a wonderful, clear, concise address there on some of the problems which the rural electric systems face in the field of atomic energy. Also on our program was a 2-hour panel discussion on the promise of atomic power for the rural electric systems. This panel was attended by over 1,500 managers and directors of rural electric cooperatives and power districts. We were fortunate to have Mr. A. V. Peterson,

director of the atomic energy department of American Machine & Foundry Co., speak as a member of the panel on recent technical developments in atomic power of interest to rural electric systems. We also had the chairman of our atomic energy committee, Gordon Loveless, speak on "What the Rural Electric Systems Are Doing in an Effort to Participate in the Atomic Power Program." Also our staff economist, Dr. Clay Cochran, spoke on "A Legislative Program for a Dynamic Atomic Power Program." There was one additional topic on the panel which was to be discussed by an official of the AEC. This was the topic, "What the AEC Is Doing To Implement Atomic Power Provisions of the 1954 Act," but unfortunately all the AEC officials were too busy to attend our meeting in Atlantic City. They seem to be available to address private power or industrial groups which request them, however. This panel was enthusiastically received, and there were many questions from the audience.

Mr. Peterson agreed to meet in the afternoon with representatives from the various States who were interested in atomic power. We announced at the panel that Mr. Peterson would be available for this purpose, but we had no idea of the response he would receive. He had a continuous flow of people coming in to meet with him during the afternoon and discuss their problems and how their local systems or their associations of cooperatives and power districts can more actively participate in this program, and in particular how they can submit proposals to the AEC. This shows that our people are eager, indeed hungry, for information about atomic power.

Also at the meeting we were fortunate to have two models of atomic plants, one a model of the Duquesne Light Co. pressurized water reactor which is now being constructed at Shippingport, Pa., and the other a model of the Army package reactor which is being constructed at Fort Belvoir, Va. There was always a crowd around these two models examining them, asking questions about them, and trying to absorb everything they could from them. Atomic power fascinates our people, both from the hope it offers of more adequate supply and from the standpoint of cost. They want to go ahead in this program, they want to do something about it.

We feel we are making some progress, but we are still concerned about certain trends and developments which appear to be strengthening the control of monopoly over this great new technology. I wish to comment on some of these trends and developments a little later, but first I would like to tell you about some of our wholesale power problems, problems which make it imperative that our people get into this program. We feel that atomic power can offer them some assistance with these problems, many of which have plagued them for years.

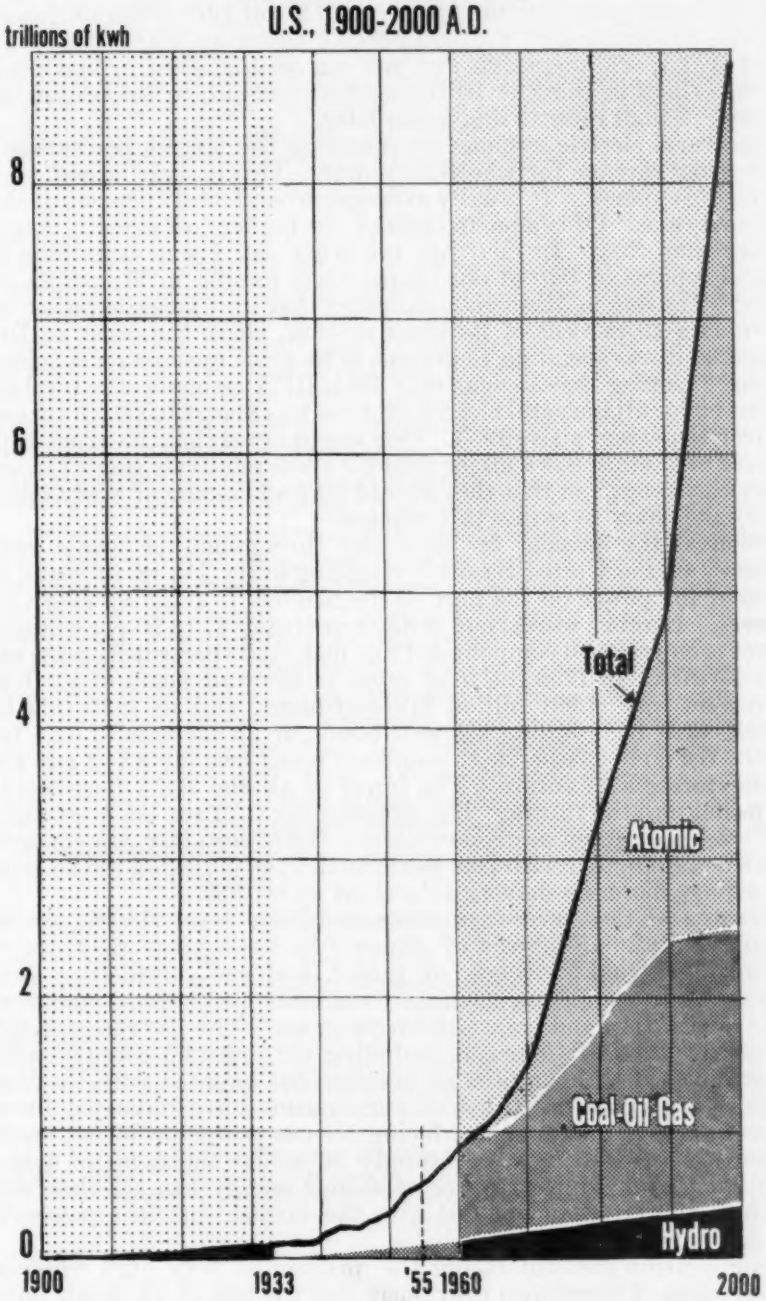
I would like to digress just a moment to call your attention to this chart, which was prepared after a great deal of study, which we had enlarged in substantial proportions at our meeting, and which is also contained in the printed copy of my statement at our meeting, which we shall give you if you want it, which projects into the future the use of electricity as we see it and the sources from which the electricity will have to be produced as we believe.

(The chart referred to follows:)

CHART 1

Electric Production

U.S., 1900-2000 A.D.



Mr. ELLIS. Maybe you can see that this is the point on the chart at which we are now, 1955. Truly, these lines on the chart seem fantastic, but we think they are amply supported by all of the evidence and studies which are now in existence.

For several years into the future, until about 1970, these projections are the projections of the commercial power industry itself from Electrical World magazine, and you can see that even in that period of time there is going to be tremendous increase in the use of electricity. I shall refer to that again later.

The rural electric systems are spending the largest percentage of their gross revenue for wholesale power. This is their largest single operating expense. It usually averages around 32–33 percent of their gross revenue. Of course, in some of our higher cost areas it is much higher than that. In fact, just the other day I was examining the annual reports of two of our cooperatives located in Minnesota and Iowa. The one in Minnesota indicated that its wholesale power was consuming 49 percent of its gross revenue, while the other in Iowa indicated it was spending 45 percent of its gross revenue for wholesale power. During the calendar year 1954, REA estimates the total cost of power for all the rural electric systems was $140,600,000, an increase of over 15 percent above 1953. One would agree that the expenditure of over $140 million is a major item for these relatively small farmers' electric systems, and that they should take advantage of every opportunity they have to reduce this expense.

Whereas the demand for electricity throughout the whole power industry of the United States is doubling every 7½ to 10 years, the demand for power on the part of the farmers is doubling every 4 to 5 years. In other words, our systems are using 15 to 20 percent more power each year and compounded this means 100 percent increase each 4 to 5 years. In 1952 the total input in kilowatt-hours of all REA borrowers was 11.991 billion kilowatt-hours, and in 1953 this had increased to 13.89 billion kilowatt-hours, or an increase of 15.8 percent. We do not visualize this upward trend leveling off at any time in the foreseeable future. The input of all the REA borrowers is projected into the future. The figures after 1953 are REA estimates, and we believe they are conservative. They certainly are conservative when compared with past performance, as indicated in the actual percentage increases shown on the chart up to 1953.

Because of these ever-increasing loads, our rural electric systems require additional sources of power. In some areas they are experiencing actual shortages of power, and are considering establishing their own generation and transmission systems under the REA generation and transmission program. This is true especially in certain areas of Colorado, including the uranium country where we are blessed with supplies of uranium but haunted with shortages of power. About one-third of our systems have indicated in our annual surveys that they are facing serious power problems, among which are inadequate power supply or actual shortages of power. Perhaps this great new source of atomic energy can alleviate some of these shortages and at last give the farmer sufficient power for his ever-increasing needs.

Our systems are still facing the problem of very high wholesale power costs. I mentioned previously that the cost of wholesale power consumes the largest percentage of the gross revenue of our systems.

On Exhibit No. 3 (p. 467) is listed the wholesale power costs of the rural electric systems for the year ending June 30, 1953, by States in order of decreasing cost. You will note that Alaska had an average cost of 2.88 cents a kilowatt-hour—wholesale; Maine, 1.54 cents per kilowatt-hour; Minnesota, 1.40 cents; New Jersey, 1.39 cents; Utah, 1.39 cents; Wisconsin, 1.37 cents; Michigan, 1.28 cents; Iowa, 1.26 cents, and so on. The high power costs seem to exist mainly through the New England, the Northeast, the North Central States, and Alaska. Most of these are high fuel cost areas.

Atomic power certainly will be competitive first in areas of high power costs and, therefore, we fail to understand why the AEC does not construct a demonstration power reactor in one of these high power cost areas. But still, as far as we know and believe, the AEC is not considering the construction of an atomic power plant for the purposes we advocate in these areas. Instead AEC is participating in the building of a demonstration plant near Pittsburgh, Pa., where certainly the supply of coal should be abundant and available at a comparatively low cost. We are sure the AEC is aware of our high power costs, for we have told them, but we have received no indication from them that they would be interested in building a demonstration plant in one of our high cost areas.

REA-financed generation and transmission program: As the loads of the rural electric systems increase, our co-ops and power districts are not only purchasing more power from the commercial power companies, but they are also generating more through the REA-financed generation and transmission program. This program has meant a great deal to the farmers of America by making available to them the right and opportunity to generate their own power where necessary in order to obtain lower cost and more abundant power. Also, it has given them a bargaining lever with the commercial power companies. In many cases this bargaining right alone has brought down the cost of wholesale power for many of our rural electric systems. The REA Administrator, Hon. Ancher Nelson, stated in a release dated January 20, 1955, that generation and transmission loans approved by REA in 1954 amounted to $40.3 million or nearly 24 percent of all loans approved by REA during the fiscal year. This report goes on to state [reading]:

> In 1954, REA borrowers added 26 generating units to their systems. These units have a greater capacity than all the REA-financed generating plants in service January 1, 1948. The new capacity sets a record for any one year of the program. The next highest year was 1951 when 115,000 kilowatts was added. Total generating capacity of REA-financed systems now is 880,000 kilowatts compared with 184,040 kilowatts in 1948.
>
> New units were completed during 1954 in Alabama, 15,000 kilowatts; Alaska, 650 kilowatts; Florida, 2,480 kilowatts; Iowa, 15,000 kilowatts; Kansas, 7,308 kilowatts; Kentucky, 40,000 kilowatts; Missouri, 55,000 kilowatts; New Mexico, 34,500 kilowatts; North Carolina, 250 kilowatts; Utah, 2,634 kilowatts; and Wisconsin, 30,000 kilowatts.
>
> Loans approved during the year provide for new capacity in Alaska, 5,000 kilowatts; Iowa, 33,000 kilowatts; Kansas, 4,690 kilowatts; Michigan, 17,400 kilowatts; New Mexico, 8,000 kilowatts; Virginia, 300 kilowatts; and Wisconsin, 50,000 kilowatts.

These loans for generation and transmission purposes did not include a loan to a new federated generation and transmission cooperative. They were for additional units in existing generation and transmission systems or local distribution systems.

Most of the generating units of the rural electric systems are small with low load factors, and in many areas, because their fuel costs are high, their generating costs are high. The generating costs of the REA-financed generation and transmission systems range from 1.9 mills to 11.8 mills per kilowatt-hour.

Some of our cost is pretty high, you see; more than a cent.

We feel that these generation and transmission systems offer definite advantages to the AEC to construct a demonstration plant. They are in rural areas where safety hazards should be at a minimum, their power costs are high, and also their low interest rates and their nonprofit operation should add to the feasibility of these early plants because of the reduction in capital costs.

I want to emphasize again that our systems look with hope toward atomic power being able to assist them with some of their very serious wholesale power problems. They want to get into this program as soon as they can and in as active a role as they can. But they are disturbed by some of the trends which are taking place in the administration of the atomic power program by the AEC. They feel these trends can do nothing but strengthen the control of monopoly over this program—the same monopoly which has fought the rural electrification program during its whole history.

AEC industrial participation program: Our people want to know how far this new atomic energy technology has developed, what possibilities it offers for assisting them in some of their problems, and also how they can fit into this AEC power program. Our Atomic Energy Committee has discussed this problem at length, and they think that perhaps one of the ways the rural electric systems could find out what is happening and acquire more knowledge is through a real study group in the AEC's industrial participation program. But when we first considered this, we realized that it presented terrific problems.

We were told originally that the AEC required each study group to spen dat least $100,000 a year on this study. We, of course, have no such financial resources. We also realized that we could not afford to hire specialists with advanced training in the fields of nuclear physics, metallurgy, and engineering, which are almost essential to the successful conduct of a study group.

Senator GORE. If you had the hundred thousand dollars, you might hire some from within the AEC.

Mr. ELLIS. We might. We couldn't hire many of them, however, at the rates at which they are going out of there to industry.

For instance, I note on page 227 of the printed hearings before your committee on the development, growth, and state of the atomic energy industry, that Walker Cisler, president of Detroit Edison Power Co., states [reading]:

> We have a group of more than 50 people working full time on our project. Among them are skilled and experienced physicists, chemists, engineers, and metallurgists, many of whom are recognized as authorities. Other specialists are engaged in directing research and development projects and in coordinating and evaluating the results. We believe they are as competent as any group in the business. We have supplemented this group by retaining some of the top consultants in the field.

So you see what we are up against when we try to think about setting up such a study group.

Senator GORE. Do you have any information as to whether those consultants he has retained are also consultants to the AEC?

Mr. ELLIS. I am not sure about that, Senator Gore, but we do have information, as I shall mention later, that certain other consultants retained by AEC are retained by groups either of or which are supported by the commercial power industry.

Senator GORE. Excuse me. I will not break in any more.

Mr. ELLIS. That is all right.

Our small rural electric systems certainly cannot compete with this, and do not have the resources to hire people with qualifications like this. But, at the same time, we believe that we must not be excluded because we are poor.

In our letter to the AEC dated September 15, 1954, in which we proposed a study group, we stated [reading]:

> The rural electric systems, of course, are small consumer-owned electric systems. They feel they should have the same opportunity to participate in this program as the large commercial power companies and that they should not be discriminated against because they lack the financial and personnel resources of the larger commercial and industrial study groups.

After discussing this problem with the staff of the AEC and with the members of our atomic energy committee, we decided that perhaps we could join in some sort of a joint study group with REA. REA in the past has done much basic research in the field of rural electrification which has brought down costs tremendously, and which has been one of the factors in making rural electricity available to almost all who desire it. We felt that REA should also pioneer in this field and make atomic power available to the farmers of America.

We also felt the Congress would allow them the funds to hire the necessary technicians or consultants to work with and advise the rural electric systems. In fact, the Congress made an additional $200,000 in administrative funds available for REA during the present fiscal year. The Senate Appropriations Committee in its report stated that it feels that part of the amount recommended for "Salaries and expenses"—we think it was referring particularly to the $200,000—should be used by the Rural Electrification Administration to give—

> appropriate attention to the possibility of utilization of atomic energy for electric power generation in rural areas.

Therefore, we feel REA does have the funds and the authority to hire the necessary technical assistants and consultants, but they have not done this.

Our officials have several times requested REA to join the rural electric systems' atomic energy committee in such a joint study group. The REA Administrator has agreed to hold consultations between the REA personnel who have security clearance and our people who have such clearance. But that is about all and that is not enough.

Recently on February 11, 1955, we received a letter from the General Manager of the AEC in which he states [reading]:

> We have been informed by the Rural Electrification Administration that in October 1954, in a letter to you it outlined its plans to maintain a liaison group with the AEC, rather than enter a study agreement either alone or jointly with others. Through this liaison group, it expects to follow closely all developments in the nuclear-power field and to keep the AEC advised of the needs and interests of the REA program and the REA borrowers. We have not had any indications that REA has changed its plans in this matter.

This indicates that not only does REA not presently plan to enter into a joint study group with the national organization of the farmers' rural electric systems, but they also are not planning to enter into a study agreement with the AEC by themselves. This means that they would not have to present the AEC with any definite program of study with objectives and goals which they are going to try to attain, and also it means that they would not have to be under the discipline of having to make periodic reports to the AEC as required for all study groups.

We think it is fine that REA has obtained clearance for some of their top administrative personnel, but we wonder, under these conditions and with the heavy administrative responsibility which all of them have, just how much they are going to be able to do in this field. We, of course, were very disappointed that REA would not help us with the difficult problem of obtaining adequate technical assistance for our study group.

In fairness, REA Administrator Nelsen has stated to our NRECA Board of Directors that AEC has advised him that it will make available to REA some of its specialists for consultation purposes. That is fine, but that's not what we are talking about. We want REA to engage technicians in the field of atomic power to work and fight for the things rural electrics need—to become our advocates before the Atomic Energy Commission.

We at first thought perhaps we would be able to receive some specialized technical assistance from the AEC, but we realize the staff of the Reactor Development Division is very overworked. They have told us so several times. They seem to be so overworked that they were unable to send anybody to our annual meeting in Atlantic City to participate in an atomic power panel and speak on What the AEC Is Doing To Implement the Atomic Power Provisions of the 1954 Act.

Several times we have contacted the staff of the Reactor Development Division about some problem which we felt would require a little research before they could give us an answer. But they tell us that they do not have time to do this research and prepare a letter on it; instead they would like to give us whatever facts they can over the phone. We do not blame them because we realize their burden is very heavy especially since they are also responsible for certain work in military reactor development. We believe this points up the fact that your committee should direct the AEC to establish a division of civilian power application and also should direct them to build up their staff so assistance can be rendered to groups such as ours.

We submitted our proposal for a study group on September 15, 1954, and were notified on January 12, 1955, that it was approved by the Commission. On November 1, and November 8, 1954, we submitted certain forms for members of our group to receive security clearance from the AEC. We are still awaiting clearance of some of the group before we proceed with our study. We are not sure how much we will accomplish in this study because we are unable to obtain technical assistance from REA or from the AEC. But still we do not know of any other way to acquire even a limited knowledge of what is going on except through a study group, and we do hope this committee will be able to give us some assistance with this problem.

I wish to call your attention to section 8 of the first part of the attached atomic power policy statement which was adopted at our meeting in Atlantic City. This section reads [reading]:

> The AEC should be urged to provide adequate technical assistance to an NRECA or joint REA-NRECA study team and request additional funds from the Congress for that purpose if necessary.

Also we are concerned with the fact that Commissioner Libby announced to your committee that in the near future the AEC is going to impose certain charges on the study groups for services rendered by the AEC. Commissioner Libby stated, as quoted on page 4 of the printed hearings, that in future study agreements they are going to charge for processing security clearances, reproduction and handling of publications, and also for services provided by AEC laboratories at the specific request of participants. He also stated, page 12, that the whole study group program, from its inception in 1951 to the end of fiscal year 1954, has cost the Commission only $344,000. This seems like a very small investment when one considers that the people have over $13 billion invested in the AEC program.

We are opposed to the AEC imposing any charges for services rendered under the study agreements. To do so now would work a great hardship on such groups as ours. We believe such charges might actually exclude small groups such as ours, which are faced with the tremendous problem of trying to obtain competent technical assistance on their studies. We believe, in order to make this knowledge available to all the people and to as many groups as possible, it should be rendered by AEC as a public service without charge. In fact, we believe the AEC budget should be increased for this purpose.

Representative COLE. What kind of study groups do you have in mind, Mr. Ellis, for the cooperatives to participate in?

Mr. ELLIS. We would hope, Congressman Cole, to be able to participate in a study group that would place us on a somewhat equal footing in terms of knowledge and our opportunity to offer suggestions, as the commercial power companies are in, but we simply do not have the resources with which to do that.

Representative COLE. All to what end?

Mr. ELLIS. To the end of trying to further the possibilities of the development of the kind of reactors that we need in these rural areas.

Representative COLE. You do not claim, and it is not a fact, is it, that the rural cooperatives are skilled in the generation of electricity? They take their generator equipment from the standard manufacturers of power equipment, do they not?

Mr. ELLIS. No, sir; I cannot accept that.

Representative COLE. I never knew that the REA spent any money on research and development, new ways of developing electricity, improvements on processes and equipment. Does it?

If it does, that is something new to me.

Mr. ELLIS. Let me say it this way, sir.

Representative COLE. Do you do that sort of thing?

Mr. ELLIS. Yes, some of that is done, sir. REA has done some of that.

Representative COLE. REA cooperatives have done research in engineering, improvement of techniques, in generating electricity.

Mr. ELLIS. Let me say it this way, if I may. We are generating about 15 percent of your own power. We have some rather substantial generating systems. We have, we think, some of the best engineers in the country, both operating those systems and as consultants to help us build and operate them.

Now, on the REA side of the picture, REA has had, from almost the beginning, research and engineering assistants to help us in this field.

Representative COLE. To help you put together the best equipment that is available in the market?

Mr. ELLIS. Yes, sir; not only that, but to help us——

Representative COLE. But the REA cooperatives are not engaged, or at least I cannot understand why they should be engaged, in spending their money for the purposes of research and development improvements in the engineering techniques of generating electricity. You are the consumers of those things. You are the users of them. And through the use of those equipments you generate electricity which is distributed to your people.

Mr. ELLIS. We are also in the generating field.

Representative COLE. I know you are in the generating field, but you are not in the field of manufacturing equipment.

Mr. ELLIS. Oh, no. Why is Walker Cisler and why are 42 power companies in the study groups working——

Representative COLE. Because they are constantly engaged in the process of improving their techniques.

Mr. ELLIS. So are we. And I think we have much greater problems than the power companies.

Representative COLE. Are not the power companies now in a position to take advantage of the most economical and efficient system for generating electricity that is available?

All you have to do is go out and buy it.

Mr. ELLIS. I think I would have to answer your question "Yes." However, we are not in a position to know what is the most economic and best.

Representative COLE. You engage consultants for that purpose, you say.

Mr. ELLIS. That is my point. We are trying to get into this atomic production field to the same extent that we are into the production field in the use of coal and oil and gas. We are excluded from it now. We are not permitted to have the knowledge, even, that we have got to have in order to know the extent to which we can participate in this field.

Representative COLE. I, for the life of me, frankly, cannot understand what purpose the cooperative electrical groups would have in wanting to be engaged in a study group.

Mr. ELLIS. Well, maybe I can throw some further light on it.

Representative COLE. If you were engaged in making the equipments, the generators, the turbines, the furnaces, and all that sort of thing, that would be a different thing. But you are the users.

Mr. ELLIS. Are the 42 power companies in the study groups engaged in making equipment? We are in exactly the same position they are, and they seem to be greatly interested. They have been in these study groups for 4 or 5 years, spending a great deal of money.

Representative COLE. You know that anything they are able to discover as a result of their efforts is going to be made available to you and these cooperatives.

Mr. ELLIS. No, sir; we don't agree with that.

Representative COLE. You have just agreed with me that there is available to you for your purchase and therefore, your use, the most efficient generating equipment that is available on the market.

Mr. ELLIS. The most efficient that is available on the market? Mr. Cole, we have had to pioneer several things in the rural-electrification program ourselves in order to make the program work in rural areas. For instance, when we started out, we had the old meters, that had 3 to 6 wheels running in opposite directions, and it would take an expert to read one of them. Our people could not tell how much electricity they used.

Furthermore, if we used those old meters, we had to send experts around to read them. And if we followed the utility-company practice, that would be every month. Now we have over a million miles of rural-electric lines. We pioneered a new meter. The companies in America would not build it.

Representative COLE. What do you mean when you say "we pioneered a new meter"?

Mr. ELLIS. We pioneered the construction.

Representative COLE. Did you spend money for the research and hiring engineers which resulted in a new meter?

Mr. ELLIS. REA did that, yes, sir, partly in consultation with the rural-electrification systems. And while I was not with the program at that time, I am advised that American companies refused to build the meter, and they had to go to Canada and make a tentative arrangement with a company there to build a meter, one that would run like a clock and that our people could read, before the American companies would agree to build it. Now, think of the cost of sending men out each month to read meters. What we do is let the farmer read the meter himself and save money. That is just one of the things we have pioneered in the rural-electrification program to cut down costs in rural areas.

REA at the moment has several technicians to help us in rural electrification generally, and we would like to see them put on the staff—experts in this atomic field; maybe at least a nuclear physicist and a metallurgist.

Representative DURHAM. Under present arrangements, if, for example, General Electric or Union Carbide or some of those people develop a reactor which is more efficient, or which is efficient, there is nothing to prevent you, if you have the necessary funds, from going out and purchasing that and putting it into production of power?

Mr. ELLIS. You are right.

Representative DURHAM. It would look to me that the approach to it would be to use the technical staff of these people who are highly qualified to build these reactors and not try to get into a field here and staff a field which is going to be quite expensive to you when you get into this technical field of trying to build up a technical staff.

Mr. ELLIS. I don't think I made myself clear, then. What we want to be able to do is consult with AEC, consult with indsutry, on devel-

oping the kind of reactors that we think would be of greatest use to us in the rural areas.

Now, for instance——

Representative DURHAM. We have been in AEC now for about 12 or 16 years, and still we haven't got a reactor that will produce power efficiently. So you can imagine what kind of a problem you face here in that respect.

Mr. ELLIS. Yes, sir. I think you can.

Representative DURHAM. I have no objection to you studying it. I am just pointing out some of the difficulties that you face.

Representative COLE. You see, all of these study groups, using the term advisedly to describe a certain type of inquiry, contemplate the eventual investment of substantial sums of money, with the prospect that it may succeed, or it might happen that it might fail. I do not assume that the cooperatives are interested in that kind of arrangement. You are not ready to go out and gamble money in the research and developmental stage of a reactor.

Mr. ELLIS. No. I think I have not stated my position well.

I have it covered further, later on.

But let me say this, at this point. You see, we don't know, as we sit here at this moment, what has been done. We are excluded from the knowledge of what is going on within the program. We, too, have to plan for years ahead in our program, and we think that at the very least we ought to be permitted to have the knowledge of what is going on.

Now, AEC itself has told us that it cannot provide us from day to day and from time to time with the complete knowledge in this program that it thinks we want.

Representative DURHAM. Let us put it this way. Has your group ever initiated movement to build a powerplant by coal, depending on coal, from the ground up?

Mr. ELLIS. You mean have we engaged others, or built it ourselves?

Representative DURHAM. Built it yourselves.

Mr. ELLIS. No, we have not, and we do not propose to do that with the atomic-energy plant.

Representative DURHAM. You do not propose to build it?

Mr. ELLIS. No, sir.

Representative DURHAM. If you have not built a powerplant for the use of coal, have you built one for hydroelectric?

Mr. ELLIS. Maybe I did not understand you, Congressman Durham.

Representative DURHAM. Here is the unit that produces the power that we are talking about. This is going to be just like a steam boiler. There is no difference. The fuel element is the main element of difference, and that is all there is to it.

Now, you have not built hydroelectric-generating-plant facilities through your group. You have not built conduction of power by coal energy. Now you seem to want to get into this picture of building these plants.

Mr. ELLIS. Then I misunderstood your question, Congressman. We have built many coal-fired electric plants around the country.

Representative DURHAM. You have built those?

Mr. ELLIS. Yes, sir. And we have built some hydro plants and some oil-fired plants, but that was in the early stages.

Representative DURHAM. Did you build those from the ground up, or did you buy them already built?

Mr. ELLIS. No; we built them from the ground up.

Senator HICKENLOOPER. Mr. Chairman, may I just clarify this in my own mind? Because there is some confusion as to what you two gentlemen are talking about, in my mind.

Do I understand that when you say "from the ground up" you mean REA has designed the generators and fabricated the generators, designed the boilers and fabricated the boilers, and then installed them, or has REA purchased generators and purchased boilers and then contracted for the brick and the mortar and the installation in which those already designed and built instruments have been installed?

Representative DURHAM. That is what I was trying to get at.

Senator HICKENLOOPER. I know that REA has built plants, because they have in my own State. But Westinghouse or General Electric or somebody has built the generators, and the boilers have been built someplace else, and the wires have been fabricated someplace else. It has been an assembled job. But it is like any other power company, that does not design its own generators, necessarily. They will buy them from somebody that makes the generators and install them. Because I know an appliance that has been built in our State, but it is the assembling of machinery they have purchased from someplace else, and then the bricks and mortar and all the rest of the stuff is put together, like almost any other utility company does.

Senator GORE. Is one of your desires to be able to know some day what you might want to purchase?

Mr. ELLIS. Yes, sir; and even back of that, to be able to consult with people about the kind of research that ought to be done to achieve for us the kind of peculiar efficiencies which we must have in some cases.

Now, we always consult with our own engineers whom we employ—and we have to employ among the best—and always consult with REA's engineers in the design of our plants, which we have built in Iowa and many other parts of the country. So we are in on the consultations as to those from the beginning. And while some factories build them according to our design and specifications, and usually they are according to some other plans that have already been perfected, still there are those things that we are interested in which are peculiar to our own type of operation.

Representative DURHAM. Do you think we should furnish all of this information absolutely free to you?

If we are going to do that, we have to furnish it to all of them. You are charging us here with being impartial. But you are in the same kind of position I am. I like to ride in a Cadillac, but I have to use a Ford.

Mr. ELLIS. Let me see if I can say it this way, Mr. Durham. We think the commercial power companies are able to participate because of their size in this program with AEC, and we think AEC is furnishing them a great deal of information without cost.

Representative DURHAM. That is something, of course, on which I cannot fully agree with you, because we have services in return which have been very valuable. I suppose you are speaking with people like General Electric, who have had contracts with us over the years

and have been participating in the production of fissionable material for nuclear weapons.

Mr. ELLIS. I think we could give them something in return, too.

Representative DURHAM. I think you know, of course, how popular rural electrification has been with the Congress. It is a question of wanting to help you if you can get this thing in the right perspective. But you want to put yourself in the same position in which other people find themselves.

Mr. ELLIS. That is all we are trying to do, to maneuver ourselves into a position where we can break even with the commercial companies in the matter of opportunity to consult.

Representative DURHAM. Do you feel you have been denied anything?

Mr. ELLIS. Yes, we are denied the opportunity to learn what is going on in the field.

Representative COLE. Are you familiar with what has been known as an access agreement, directed toward making information available to people interested in the field?

Mr. ELLIS. Yes, I think so.

Representative COLE. Has any cooperative ever been denied or has it ever asked for an access agreement?

Mr. ELLIS. We haven't, because we were trying to work toward the study group arrangement.

Representative COLE. That is the initial step. Is that not the initial step looking toward a study group, the latter matter involving the expenditure of considerable sums of money which you say you do not have?

Mr. ELLIS. I am getting my cart ahead of the horse here in some places, as to the way I prepared the statement.

But let me say again at this point that AEC has approved a study group arrangement with us on a different sort of plan without requiring us to put up this hundred thousand dollars, without requiring us to hire the metallurgists and physicists and so forth. We just are not going to have them, because they will not be available to us from any source, and therefore we are only going to be a half-baked study group. That is what it amounts to. And they have actually given some clearance to some of our people, a "Q" clearance to people on our committee.

Representative COLE. I am more bewildered than ever, if you say now they have made a study opportunity available to you, providing you furnish your own technicians. What more do you want? Do you want them to supply the technicians, too?

Mr. ELLIS. Congressman Cole, we think that unless either AEC—and we don't think they can do it all—or the REA make available to this farflung rural electrification program certain technicians, maybe only 2 or 3 people, which wouldn't cost much, and maybe not even on a full-time basis, to work with them in their other work which they are going to do anyway——

Representative COLE. You will agree, then, that if the Commission should decide to make available to cooperatives the technicians and scientists to help the cooperatives in carrying out their study program, the Commission should also make available to the Detroit Edison and the Consolidated Electric and General Electric technicians and scientists to help and advise them?

Mr. ELLIS. I don't know if I am qualified to answer your question.

Representative COLE. Well, you agree if it is done for one segment of our citizenry, our economy, it should be made available to all?

Mr. ELLIS. I think when I have developed my statement here, Congressman Cole, you will see that we think that we are being discriminated against by the AEC, either because we are cooperatives or because we are poor, or because of other reasons, and that if we had the same study group and the same technicians, we would still be at a disadvantage.

Representative COLE. I think probably there may be a discrimination. But it is not one that is imposed by the Commission. It is because you are poor. Cooperatives are poor. They do not have the resources to engage the scientists to advise them and help them out in these study programs. But this is a discrimination for which the Commission is not responsible.

Mr. ELLIS. If the Commission, for instance, at this time should start as it has announced it is thinking of doing, making charges to these study groups for all the work they do with them, having made their services free to the study groups now for 4 or 5 years, during which time we could not qualify—if the committee starts imposing those charges now, it is certainly going to work a great hardship upon the rural electric cooperatives, who are just trying to get started in this field.

Representative COLE. I do not think it is correct that the Commission has made available the facilities of the Commission for particular study groups on a free basis. They have made available to study groups whatever information the Commission might have on a free basis, but it has not provided the study groups with the advisers and the consultants and the technicians.

Mr. ELLIS. Here is another problem we think is related to it——

Chairman ANDERSON. Would you not agree with Mr. Cole on that last statement, that it has not?

I believe Detroit Edison has put up their own money. Would you agree with him on that?

Mr. ELLIS. I think that is true, as I understand it. I also think that they have had a tremendous advantage all the time in working with them.

Representative COLE. They have had the advantage, because they have had the financial resources to carry it out. That is correct. I agree with you. It has been an advantage, unquestionably. But it is not an advantage that has been contrived by policy with the Commission.

Senator GORE. Is there not some way that the public interest can be protected? Is there not some way that small business can be given an opportunity? Is there not some way to do those two things and still give a helping hand to private industry in the development in this field?

Mr. ELLIS. Senator Gore, that is one of the things that I am trying to say now and later on here. And that is that the Federal Government has always, from almost the beginning, as I have understood its history, made provision for protecting the public interest.

Take the field of agriculture. What could the little farmer do today if it were not for the various services provided him through the De-

partment of Agriculture and through the State experimental stations, supported in part by Federal funds?

Representative DURHAM. Also, has not the REA got about all the funds they ever asked for here since the beginning? I know of no Government agency that has come nearer getting what it requested, whether it is for research or anything else.

Mr. ELLIS. Yes, sir.

Representative DURHAM. Now, if they have not asked for this, it has been negligence on their part to a certain extent. It is not the Commission's fault.

Mr. ELLIS. We are not blaming the Commission.

Representative DURHAM. We usually finance it through Government funds, loan it to you so that you can pay it back.

Mr. ELLIS. Our proposal is for a civilian division within the AEC. As long as the reactor section is responsible to the military and is working primarily, I would say, in the military field, we simply cannot expect the kind of assistance from them in the civilian field that we would get, we think, if AEC would set up a separate civilian administration within the AEC to work with groups such as ours and the commercial power industry in this field.

Representative COLE. Your statement is correct that the reactor division is, as you expressed accurately, primarily, of course, interested in the production of material for weapon use; but that is by no means an exclusive interest, and within the past year there has been very positive evidence that the reactor division is concentrating its efforts on civilian applications of atomic energy rather than weapon use.

Mr. ELLIS. Yes, sir. I don't disagree with that. I don't know it to that extent. But we have other problems down there, too. It seems that we go back to AEC to talk with them and see them or call them in the reactor division.

When we first started talking with Dr. Halfstad and then with Dr. Peterson, and then with Kenneth Davis, there has been such a turnover down there that we have not been able to get very far, we feel, in working with the Division. And that, piled on top of the fact that their primary consideration has been military, has made it difficult. I say that without any criticism to any individual. It is just a situation that we have run into.

It was Commissioner Libby, by the way, who recently announced that AEC is now going to impose certain charges to study groups for services, which, in the past, it has rendered without cost.

There is no question but that the AEC is making administrative regulations which will determine the course of the atomic power industry for years to come. The rural electric systems are being excluded from consultations which are taking place in connection with the formulation of these administrative regulations. I wish to call your attention to section 7 of the second part of attached NRECA atomic power policy statement, exhibit 1 (p. 464). This reads as follows:

> The AEC should cease making basic policy decisions in the atomic power program without adequate representation of rural electrics, municipal, and Federal power systems, as these policies being established are almost as important as legislation, and there is every evidence that the private power companies are already being consulted while other groups are excluded.

General Nichols states on page 84 of the printed hearings in discussing regulations which are now being formulated at the AEC:

> What we are doing is setting off a whole new industry. We feel that if we make some basic fundamental errors in the beginning, we will be in serious trouble—

Still the rural electric systems are being excluded from these all-important deliberations.

On page 57 of the printed hearings, General Counsel Mitchell states that the AEC is working on regulations in eight major areas, among which are the distribution and use of special nuclear material, the production and utilization facilities, operators' licenses, radiological health and safety, security, control of source material, control of by-product materials and rules of practice. He also states on page 58:

> As the various phases of our work reach the point where discussions with representatives of affected groups appear desirable, therefore, we plan to set up conferences for that purpose. * * * Conferees selected for attendance at any meeting or series of meetings will be selected with a view toward obtaining representation of a true cross section of the industrial and other groups affected, with due consideration given to geographical distribution, size of company, public or private ownership, and other relevant factors.

Let us examine what representation the rural electrics have on one of these advisory committees. On February 10 the AEC announced the establishment of a committee to advise the AEC on proposed licensing regulations and policies. Appointed to this advisory committee were the presidents or chairmen of 14 of the largest power companies in the country, the Chairman of the TVA, managers of 2 public systems, 1 of whom is also president of the American Public Power Association; and the president of 1 nonoperating rural electric cooperative. We think this cooperative is composed of fine people, but at the same time we believe that by its very nature it is absolutely unrepresentative of the needs of the rural electric systems.

We consulted REA about this cooperative and they told us that it was incorporated under the REA Act and Florida law on February 9, 1948. REA stated it has no manager or paid personnel, and they have never filed a firm application for a loan. It is just a paper organization. This is the organization which has been selected by AEC to represent the interests of the farmers' electric systems. I maintain that this amounts to exclusion of the rural electric cooperatives from these important deliberations. Why does AEC thus ignore the national organization of the rural electric systems?

On February 17 we sent telegrams to both Admiral Strauss and President Eisenhower protesting the appointments to this committee as being absolutely unrepresentative of the electric industry, and certainly to the exclusion of our part of it.

In this telegram we ased for representation of NRECA, the national service organization of the rural electric systems. We have not received any reply to these telegrams.

What about some of the other AEC advisory groups? Do they have adequate representation of the consumer-owned electric systems, labor, and other interested groups? According to the 17th Semiannual Report of the AEC, the AEC's General Advisory Committee, which advises the Commission on scientific and technical matters relating to materials, production, and research and development, consists of 7 university officials, 1 official connected with the Brookhaven

National Laboratory, and 2 representatives from private industry. The two representatives from private industry are from the Standard Oil Co. and American Telephone & Telegraph Co.

According to this same report, the Advisory Committeee on Industrial Information which "visits AEC's sites to identify information of use to industry which should be submitted for declassification and recommends arrangements for widest possible publication and distribution of such declassifiable information," consists of representatives from such publications as Steel, Electric Light & Power, Power Engineering, Metal Progress, McGraw Hill, and such organizations as the Atomic Industrial Forum, National Association of Manufacturers, American Institute of Mining and Metallurgical Engineers, et cetera, but there is not one representative of the publications of the rural electric systems or public systems on this advisory committee.

As you know, and as AEC knows, there are two recognized magazines in these fields, Rural Electrification magazine, published in our organization, and Pubic Power magazine, published by the American Power Association. This group certainly has a vital stake in the amount of declassified information which is going to be made available and the channels through which it will be available, but they have no representation on this committee.

One can examine other advisory committees such as the Committee on Reactor Safeguards and the Patent Advisory Panel and the same pattern exists. Most of these advisory committees are composed of representatives of the big corporations or officials of our colleges and universities. We believe there should be proper technical representation on these committees, but at the same time we believe that rural electric and public systems should also be adequately represented.

Chairman ANDERSON. Have you discussed this at all with the Atomic Energy Commission; their failure to make some appointments from your groups?

Mr. ELLIS. Yes, we have, Mr. Chairman.

Chairman ANDERSON. Have they given you any answer at all?

Mr. ELLIS. No, sir.

I just want to point out one example of what can happen when the rural electric systems are not consulted on some of the regulations being promulgated at the AEC. On page 77 of the printed hearings General Nichols discusses the various charges which the AEC is going to impose for fuel used in a nuclear reactor. He states that they will charge for the material burned up, the cost to convert the material, and the recovery of the plutonium or U–233. Also he says they are going to charge interest on the fuel investment which the AEC loans to the reactor licensee. General Nichols states:

> This is brought in here because we cannot sell the material to them and yet that is a big part of the capital investment in a reactor, that is the fuel investment, so we felt the fair thing to do was to charge interest, and 4 percent was what we established * * *. We debated whether is should be 2½ percent or 4½ percent as used by some Government agencies, and some people say they can borrow at 3½ percent, but after discussion, decided on 4 * * *. This has generally not been subject to too much criticism, so I think we are coming close to what is logical.

Of course it has not been subject to too much criticism when the rural electric systems have not had an opportunity to participate in this important decision.

Representative DURHAM. Of course, no other group was consulted in the making of that decision. He had to make that decision himself.

Mr. ELLIS. Of course, it doesn't affect the commercial companies like it affects us, because of the very nature of the setup of the two different groups.

Representative COLE. Why does it not affect them the same as you?

Mr. ELLIS. Well, they are able to absorb an interest charge, and if they want to go into the atomic business their systems are so big that they are able to pass on the cost to the consumers in relatively small amounts; so that they are not as vitally affected by such an interest charge as we think we are.

Representative DURHAM. In a matter of that kind, I think the country is necessarily going to have to trust this committee and the AEC to arrive at what we feel is a fair price.

Chairman ANDERSON. You are objecting on the basis that you were not consulted at all?

Mr. ELLIS. I accept Chairman Durham's statement that no one was consulted. But there were these advisory groups that we expected would be consulted on a lot of these matters, if not on the 4 percent interest.

In fact, the first we were aware of this interest charge of 4 percent was when we read it in the copy of the printed hearings. I know all the members of the committee are aware of the fact that the REA cooperatives pay interest at 2 percent, and this is necessary in order to enable them to render service in areas with low density and sometimes marginal economic conditions, areas which the power companies themselves in most instances did not want to serve. I maintain this 4 percent interest charge, in addition to the other charges which the AEC will make for fuel burned up and other services, may make it impossible for the rural electric systems to compete in the operation of atomic reactors. We do not want to be notified of regulations promulgated by reading them in published documents. We want to be consulted before the regulations are announced publicly.

Demonstration power-reactor program: Another development at the AEC which has caused us considerable concern is the demonstration power-reactor program which was announced in AEC Announcement No. 589 of January 10, 1955. This announcement will preclude the participation of any but a very small segment of the electric industry in the program.

Senator HICKENLOOPER. Are you referring to the Duquesne Light & Power?

Mr. ELLIS. No, Senator Hickenlooper; I am referring to this announcement on January 10 that AEC is now going to accept bids for participation in the atomic power reactor development program, and which excludes us, because we simply are not qualified to even make a bid.

Representative DURHAM. Whose fault is that? That is not AEC's fault because you are not qualified; is it? I cannot understand that kind of argument.

Mr. ELLIS. Congressman Durham, I am not trying to say that our problems are AEC's fault. I don't mean to say that.

Representative DURHAM. I do not want the people of the country to misunderstand. Here we are, the committee, in charge of a great agency of the Government. I do not want them to understand that

we are excluding AEC from a program that is essential, when everybody wants them to participate. That is the kind of a charge you are making here.

Mr. ELLIS. I don't mean to do that, sir.

Representative DURHAM. I so understood you. You said you are excluded from this research and development program. Now, how are you excluded? Because you can come in here and make application like any other individual. You have got to qualify just like I have to qualify for a license if I become a lawyer or become a doctor. What is the difference?

Mr. ELLIS. Let me make it clear.

Representative DURHAM. That you cannot qualify is not AEC's fault.

Mr. ELLIS. Not in the least did I intend any criticism of this committee.

Representative DURHAM. I just wanted that clear for the record.

Mr. ELLIS. I am sorry if anyone got that impression. I think this has been a great committee. You have done a great work. And we are coming to you telling you about problems which we think exist, in the hope that you can somehow help us figure out ways to overcome these problems.

Neither would we blame this committee for anything that AEC does. Most of the complaint, if we have complaint, runs to administration within the AEC.

The thing I am mentioning now is that they announced that up until a cutoff date they are going to accept bids of organizations to come in and enter into arrangements with AEC to participate in the atomic reactor development program.

Representative DURHAM. All right.

Mr. ELLIS. For whatever the reasons.

Representative DURHAM. You can do that, if you can qualify, just like NACA or any other agency.

REA can do it if they want to do it and can put up the money and put up the personnel.

Mr. ELLIS. We just do not think, Congressman Durham, that either we or any other group that really represents the public interest can qualify, because of the stringent requirements which have been set up.

We think those requirements should be modified.

We believe it limits participation to those study groups who have already had considerable experience and already have personnel who are cleared. The announcement states that there will be an April 1 cutoff for this particular segment of the demonstration power reactor program, but of course, it does point out that additional proposals may be accepted in the future at other specified cutoff dates. But in this initial program we do not see how anyone can participate except those study groups who have had a lot of operating experience. In fact, Commissioner Libby states on page 11 of the printed hearings:

> Only 12 of the study groups have participated for a sufficient length of time to have made significant progress. * * * Probably half of the groups have already acquired sufficient know-how to be potential builders or operators of nuclear powerplants. * * *

In other words, of the present 19 study groups, 9 to 12 of these study groups probably will be able to participate in this demonstration power reactor program.

Even if one could assume that all the study groups would be able to participate in this demonstration power-reactor program, it is obvious that even then such participation is limited to a very small segment of the electric utility industry. In the 19 study groups there are 42 private power companies, the TVA and 1 public system, Consumers Public Power District of Nebraska, which was admitted only recently. TVA, in order to participate in this program, of course, would have to obtain authorization and appropriations from the Congress. Therefore, participation is limited to what amounts to about 1 percent of the electric utility industry. This certainly does not indicate that this all-important program is getting under way in a competitive manner.

We do not see how any of the rural electric systems can submit a proposal under this announcement. They certainly do not have the technical knowledge to prepare a proposal. You will note under section 4 of the second part of our atomic power policy statement (exhibit No. 1, p. 464) that our systems want the AEC to actively encourage and assist them in submitting proposals for development and experimentation so as to encourage competition in the atomic energy program. Also it takes such a long time to obtain clearance, and we believe clearance is absolutely essential to participate in this program, because one cannot even find out what the price of the nuclear fuel will be or what price the AEC will pay for any of the special materials that are produced in the reactor. These prices, of course, are basic in determining the economic feasibility of any proposal. Further we believe we are excluded from this program because we are thrown into competition with some of the largest combines of power companies in the country, and as examples of that I wish to cite the Rocky Mountain Nuclear Power Study Group, the Northwest Utilities Group, and the Atomic Power Development Associates. We are thrown into competition with them because one of the criteria established by the AEC in determining which proposal they will accept is the following: the cost to the AEC in funds and materials. We, of course, do not have large amounts of funds available for experimental purposes—we don't have any—and also we do not have rate structures which permit us to incorporate such development charges in the rates we charge our members. We also, of course, cannot obtain tax writeoffs in order to pass on some of the benefits of this experimentation to our stockholders. But I will not get into this matter of tax writeoffs because Dr. Cochran is going to discuss this in more detail with you a little later.

America's rural electric systems simply must not be excluded from its civilian atomic-energy program. To this good hour they have been and are being excluded.

Again I wish to emphasize that the rural electric systems offer many advantages to the AEC in locating a plant along their lines. Many of them are in high-cost power areas, they are financed at a lower rate of interest than the commercial companies, they are a nonprofit operation which not only will reduce the capital costs but also will make it easier to measure the actual costs of constructing and operating a nuclear reactor. Also, they offer the advantage of being located in rural areas where the safety hazards can be kept to a minimum. The farmers' electric systems of the United States must be considered in

this important atomic energy development work; all of this work must not be channeled to the large private utilities.

Representative DURHAM. You cannot run a reactor without a physicist or a chemist, and I know I would not be able to run one. Most of our rural electrification people are farmers and are unfamiliar with these processes.

Mr. ELLIS. We think some arrangement can be worked out whereby we can have access to knowledge which would permit us to operate.

Representative DURHAM. I am hoping the same thing.

Chairman ANDERSON. You referred to the meeting on February 10 of the Committee on Proposed Licensing Regulations and Policies. Now, you were not represented on there, and 14 large private power companies were, and you felt you should have had representation on that committee. Are you planning to continue to discuss that with AEC in the hope that they may give you some representation on that committee?

Mr. ELLIS. Yes, sir.

Chairman ANDERSON. How do you stand in size with these 14 large power companies? All of the REA organizations put together would be rather a sizable group, would they not?

Mr. ELLIS. We have an investment of $2½ billion.

Chairman ANDERSON. Do any of these companies have that much invested?

Mr. ELLIS. I doubt if any one company has

Chairman ANDERSON. I would doubt it, too. So you might have some reason for hope that because of the size of your industry you might be entitled to some representation on it?

Mr. ELLIS. Yes, sir.

Chairman ANDERSON. Now, then, have you discussed that with the AEC?

Mr. ELLIS. Yes, sir.

Chairman ANDERSON. If they did that again, then you might have some complaint on it. I do not know about the publications, and I do not know any reason why they should have brought your magazine in or not. Apparently they did not think so.

On the question of the loans, again I think that is a matter that you would have to present to them, but it does seem to me if they adopt a national program that has to do with the loaning of nuclear material and establish that rate at 4 percent, they are going to have to charge you that unless there is a very strong showing why they should not.

I think possibly you have a difficult problem of presenting to them a reason why you should not pay the 4-percent interest when your interest rate is 2 percent. I do not quite see that the situations are comparable. That is just because you have a 2-percent rate on the return of your loans, because we have, as you know, inside the Department of Agriculture many, many programs where the rate of interest is above 2 percent.

The Government feels it is justified in asking those other organizations, which are cooperative, for a higher rate of interest than that.

I am trying to say to you that I hope these are administrative things that you can constantly take up with AEC, and if you fail to get consideration then we would be glad to have reports on them regularly.

Representative COLE. Before you leave this 4 percent interest rate, even though you might persuade them of the justification for them to decide to grant you the use of this material at a lower rate I doubt if the law would permit them to do it. It is my recollection—and if it is not in the law I think it ought to be in the law—that the Commission, once it fixes a rate for the use of this stuff, cannot discriminate between its users.

Now, if you have a peculiar situation which you feel in the public interest justifies REA people to use this material at a lower charge, then the remedy is to come to the Congress and get a law to permit it and not call upon the Commission.

Mr. ELLIS. I am very sorry that I used that example because I think that I didn't give the correct impression. I think that you will recall I used it in this connection: This is one of the things that happens in our absence from these advisory committees. Now, I had assumed that advisory committees had known in advance of this interest rate. I now am advised by some of you that that is not correct.

Chairman ANDERSON. I do not believe that that is correct.

Mr. ELLIS. But you can see how we can assume it. Here are all of these advisory committees from which we are excluded, and we would naturally assume that at least some of these matters are discussed with the advisory committees and that is the very purpose of them.

Chairman ANDERSON. I want to come to the reactor program. I want to fully agree with Congressman Cole that I think this is prohibited by law, any discrimination in the rate, and I also feel it was not a matter on which you could have been consulted by the very nature of it.

Now, in this reactor program, it does seem to me that it might be possible for the REA's to pool their resources a little bit and get enough money together so that you could put in a bid at a proper time, and could be engaged in reactor production. I have talked to members of the Atomic Energy Commission on this, and it seems to me that they are not hostile to the REA people having a program of this nature, and I would hope that you would pursue it further.

If you have $2½ billion industry, it has a pretty big stake in this reactor development program, and I think that it had better start making some sort of a levy on itself to get funds to do this. When you build a powerplant, as you frequently do, you have to have engineering advice, and you are able to acquire that. I think that you are going to have to find some way of acquiring this. I want you to cooperate in the program, and I am sure you know that, but I do believe that you are going to have to find some money somewhere for it. I believe that you might be able to find it throughout your membership. Do you not feel that would be possible?

Mr. ELLIS. We feel, Senator Anderson, that if we had evidence of a real workable setup as between AEC, REA, and NRECA, we think our people would be encouraged to do everything they could. Every time we take it up with them, they know the facts, and it has been in the press in various ways, so that they have a pretty good idea that they think at least they are not getting a fair shake at AEC.

Representative DURHAM. I think you probably have a just complaint on that point, but I do not see much complaint on the pricing

and the building of reactors, because I think that you are going to have to buy that on the basis of know-how anyway from somebody else; most of the companies of the country do that. I do not believe everybody is going to be able to qualify to build a reactor in this country that wants to build one. If he does, he is going to find it very expensive.

I do not know of any power companies in my section that have gone into this thing on the basis of building reactors. There is nobody in the South.

Mr. ELLIS. That is probably because fuel costs are so much higher in the North, and they are also higher for us; and that is where our people are primarily interested, in the North or areas of the West.

Representative DURHAM. You can go to any one of these research reactors, which of course will be under private supervision once they are set up, and set up a study group of your own. There is no prohibition against that. That is being done now in the universities, where they are in operation. You can get a lot of technical advice on those problems.

Chairman ANDERSON. I merely wanted to express the hope that you explore carefully, No. 1, the possibility of an access agreement to which it would seem you might be entitled, and probably ought to be entitled; and secondly, that your association might very well consider the possibility of making some type of joint contributions looking toward the possibility of taking a contract and bidding for one of these reactor contracts, perhaps in conjunction with a manufacturer of electrical equipment. You do not manufacture electrical equipment and you might find someone to join with you exactly as is now happening, I believe, in the case of the Seminole Cooperative in Florida in connection with Fairbanks-Morse.

Perhaps a group of cooperatives can join that way. While it is difficult to put up capital on the same basis that some other companies may have the capital, the very size of your membership and the very spread of the REA movement gives it enough basis so that if it decided to collect only a very small amount of money from each one, it would seem to me that they would have some money available in large quantities to participate along with other groups.

Knowing your devotion to this cause, I would think that that is something you could very well urge them to get into, because I believe it will be of great value to them.

If there is discrimiation, then I do hope that we can continue to help you in any way that we can to get better consideration from the Commission. I think when it comes to the building of reactors you are likely to find yourself where you are going to have to put up some of the experimental capital, and perhaps by charges against the individual groups. I do not know that. I am just throwing that out to you as a possibility that you are going to have to do something of that nature.

I am willing to go along with you, in other words, where you have been left off an advisory committee, and 14 large companies have been put on. I am willing to intercede with you and try to help you get somebody on that group, as you belong there properly; but when it comes to putting up money for these ventures, I know these companies are doing it. They are not the only people that have dollars, and the REA groups have some dollars collectively.

Possibly some of that money could be utilized for this purpose, and if it can't then you do have a responsibility of coming back and reporting to Congress. I really think it is a field that you ought to get into.

Mr. ELLIS. Thank you, Mr. Chairman.

Let me make one other comment on this subject, and then I will pass on. It is this; and I should have stated this earlier: That we have been discussing these problems with the AEC now for 2 years with different people there. I am sure that if you would glance at our testimony here about a year ago you would see that we were making some of these complaints then. We have done all that we know to do to work with AEC. We have asked them over and over and over again to set up groups or to make available to us people who would tell us what to do to help us somehow participate in this program, and instead of even the slightest attitude or manifestation of attitude on their part that they really want us to pursue this matter, we get discouragement. We hope it won't continue.

Representative DURHAM. There was very little they could do about that until last August when we passed the present act, because there was no time for them to clear you for any information that was worthwhile in the building of a reactor.

Mr. ELLIS. One of the points that I wanted to make about the reactors is that just because they are working now, say, on the atomic army reactor, which would be relatively small, it does not necessarily mean that they are also working on the type of small reactor that we could use.

From what little we know about it, we understand that mobility is one of the principal factors that they are working on there, and we are not a bit interested in mobility. If mobility is to be achieved at greater cost only, then of course that would be a feature that we would be interested in.

Chairman ANDERSON. I will say, however, that the army package reactor, if it follows the pattern that has been suggested to me as a possibility, would also be tremendously useful to small REA organizations because there would be certain phases of it that would discard the factor of mobility, and would be a very small application, and might be of tremendous interest and value to you.

The Government is spending many millions of dollars on that, which will be to the benefit, I hope, in time of REA, particularly in isolated areas.

Mr. ELLIS. We hope so, too, and I must say here, lest I be misunderstood, that AEC did cooperate with us in getting the model of that plant, the Army's plant, and also the model of the Duquesne plant at our meeting in Atlantic City, and there was just a constant swarm of our people around there. We are hopeful that something may come of it, too.

Now, gentlemen, I will hurry here, but let me call your attention to what we think results when you have either people who are not too anxious to cooperate in the AEC; or when they do not have people there who know anything about our problems; or when they don't have us on their advisory committees. This kind of thing can result. Let me show you.

The atomic power age seems to be here already. We are pleased that atomic power is going to become available in Illinois from the boiling

water reactor at the Argonne National Laboratory, and also that a small quantity of atomic power will be available after July 30, at the AEC installation at West Milton, N. Y. Of course, under the Atomic Energy Act of 1954, the rural electric cooperatives, among others, are entitled to preference in the marketing of this power. Let's see just how the AEC is carrying out this preference.

We first learned about the power available at the Lemont installation from an article which appeared in the Washington Post and Times Herald in October 1954. We would like to quote the first paragraph of this article.

> The AEC said yesterday its Argonne National Laboratory outside Chicago has been holding discussions with the Commonwealth Edison Co. about the possibilities of piping a token amount of nuclear generated electricity into the company's systems, or, if that company doesn't want it, the possibility of piping it into some other system.

In other words, in order to carry out the preference provisions of the 1954 act the AEC discussed the marketing of the power with the Commonwealth Edison Co. After seeing this article in the Washington Post and Times Herald, we wrote a letter to General Nichols on November 18, 1954, calling his attention to the fact that we had a cooperative located within 30 miles of the AEC's Argonne National Laboratory at Lemont, Ill. We also called his attention to the preference provisions of the Atomic Energy Act of 1954. General Nichols in his reply dated December 13, 1954, stated:

> The manager of our Chicago operations office has been asked to get in touch with the Illinois Valley Electric Cooperative to discuss in a preliminary way the possibility of its using the energy generated by the laboratory's experimental boiling water reactor.
>
> The conversations held with Commonwealth Edison have been primarily technical in nature to explore the engineering problems that would be involved in feeding the electricity produced into a general network. Similar conversations have also been held with municipal power company in Hindsdale, Ill.

We certainly are glad that they did consult with at least one preference customer, a municipal system at Hindsdale, Ill. But we believe before they enter into conversations with the private power companies they should at least consult the preference customers.

Recently we received a call from the manager of the Delaware County Electric Cooperative at Delhi, N. Y., in which he stated he had received a telephone call from a Mr. J. D. Anderson, Manager of the AEC installation at Schenectady, N. Y. The manager of the cooperative stated that Mr. Anderson said that there would be some atomic power available at West Milton, N. Y., after July 30, 1955, and he wanted to know if the cooperatives, which he understood were preference customers, would be interested in purchasing this power. He indicated he would like to have a definite answer over the phone, or at the very latest within the next 2 weeks.

We just simply cannot make any arrangements for power in such a short time. Later, he wrote a letter.

Representative COLE. On this same item?

Mr. ELLIS. Yes.

Chairman ANDERSON. I am glad that you are bringing that one up. I want you to know that some of us get interested in these things, and I had taken this letter up at one time and I thought it was a pretty bad way of doing this.

Mr. ELLIS. The manager of our cooperative tried to obtain additional information about the nature of the power and the price of the power, but was unable to do so. He did ask Mr. Anderson to put the request in writing and, as exhibit No. 4 (p. 467), you will find a copy of Mr. Anderson's letter to the manager of this cooperative. I wish to call your attention to certain parts of this letter:

> It is requested that we be advised if you are interested in purchasing this power. We have an offer from Niagara Mohawk, and we have also contacted a few other privately owned utilities which are nearest the site.

Representative COLE. Do you not think the record should show that this power on a nonfirm basis, and that there might be days when the power would be available and there might be days or weeks when there would be no power?

Mr. ELLIS. I am coming to that, and we have it covered in the statement.

Representative COLE. All right. Do you not feel that that is an important factor in assessing the market for the power?

Mr. ELLIS. I feel it is important but I do not think it ought to be controlling, because if all atomic power is to have a fluctuating characteristic then we are excluded even though we have got the preference in the law from all of it.

Representative COLE. You realize why this is a fluctuating power; do you not?

Mr. ELLIS. Yes; I think so.

Representative COLE. And therefore you know that it is not a fair statement to say that if all atomic power is to be a fluctuating power——

Mr. ELLIS. Excuse me, what I should have said——

Representative COLE. This is used in research today and perhaps not in research tomorrow, and perhaps the day after it is back in research.

Mr. ELLIS. What I meant to say was if all atomic power to be sold by AEC is to be fluctuating power, then the preference in the law has no meaning, you see. I don't think that Congress intended that.

Representative COLE. Of course it has a meaning. If there are cooperatives, public distribution systems that can use a nonfirm power, then they have the preference.

Mr. ELLIS. We will have a better chance to use it if we know about it at least at the time that the private power companies know about it. They apparently are not letting us know about it until after they have contacted the private power companies.

Chairman ANDERSON. If you have read the letter from this man, who is the manager of the plant at Schenectady, you would realize that it would be impossible for any cooperative to be able to use it. They put the provisions in that made it impossible for them to bid. Nobody could bid on it. I read it through and they said the power would be available at West Milton at 33,000 volts, and this power is a byproduct, and as such will not be firm power. The power will vary from zero to 10,000 kilowatts and it will not be possible to schedule the amount of power available. Nobody could bid on that.

Representative COLE. Not because they are a cooperative, however. It is the nonfirmness of the supply.

Mr. ELLIS. Well, yes.

Representative COLE. It is doubtful if any utility, whether cooperative or private would be in a position to bid on that.

Mr. ELLIS. I beg your pardon, I think the private utilities not only can bid on it, but will bid on it, and I believe that somewhere here he says they have got an offer from Niagara Mohawk.

Representative COLE. Because it has widespread distribution systems.

Mr. ELLIS. That is right.

Now, what happens with the Federal power systems? They have power that is not firm. They can enter into, as an incidental part of their operations, arrangements with other companies in the area to firm up all or a portion of nonfirm power, so that it can be sold to the preference customers under the law. The AEC could well do the same thing, it seems to me, without any great effort on its part. Or they could give us the right and opportunity and the time to enter into a trading arrangements whereby we might trade the power to a commercial company, perhaps giving them several kilowatts for one received in firm. That is a common arrangement in the power industry. It is done rather frequently.

Senator HICKENLOOPER. May I ask this: Are you complaining because of the order in which they contacted these prospective purchasers? As I understand it, all they have asked you or anybody else is "Would you be interested in this matter?" The power is not ready for delivery yet, and I have been interested in this for some time. I think that I may have had something to do with stimulating the early inquiries as to what could be possibly the disposition of this power from this purely experimental now and then production of electricity.

I wrote the AEC some months ago and asked them what steps they were taking to establish the reasonable disposition of this power, in the light of the law, and to see whether companies, private or public or otherwise, would be interested in this. I have been somewhat concerned about the disposition of this power.

But do you claim that this power should be sold to a cooperative there at a cheaper price than it can be sold some place else in that area or should the AEC establish a price at which the power can be reasonably sold and then give the cooperatives the preference which under the law they have to buy it at that rate?

I do not know just what your position would be in that.

Mr. ELLIS. I doubt I am capable of answering your question in that form, Senator, because I think it would take some exploration to determine all of the facts, and we do not have all of the facts.

Senator HICKENLOOPER. I hate to use hypothetical questions as they may have no substance or basis when you get down to the actual test of the thing. But suppose this power came off this generator intermittently, as it will, and it is purely an experimental generator and there would not be a bucketful of power come over there, comparatively, it will be just a little incidental power considering the needs up there. It is not a great powerplant. But suppose for the sake of argument that it was established by inquiries from any possible purchasers in that area that this power could be sold to 1 or 2 or 3 or any number of possible purchasers, at, let us say, 1 cent a kilowatt, just for the sake of a figure. If your cooperative there did not care to pay a cent a kilowatt for this unfirm power, do you think that they should

sell it to you for less than that when they could get 1 cent for every kilowatt that came out from some other purchaser?

Mr. ELLIS. I do not think that I can answer your hypothetical question.

Senator HICKENLOOPER. If you are willing to pay 1 cent a kilowatt, you have a preference and there is no question about that.

Mr. ELLIS. One of our points is that they will not tell us the price, and yet they give us 2 weeks to tell them whether we are going to use it.

Senator HICKENLOOPER. I beg your pardon. I do not interpret the statement as that. They only want to know whether you are interested, and it would seem to me that you could readily express an interest. They are not asking you to contract or to make a bid, but to ask if you are interested.

Mr. ELLIS. Let me read you this letter now:

> After we determine which of the privately owned and preference utilities, if any, are interested, it is planned to contact interested parties relative to establishment of a rate and selection of a buyer.

In other words, once the AEC determines who is interested in purchasing the power, they are going to contact all interested parties in spite of the fact that the Atomic Energy Act of 1954 states in section 44:

> In contracting for the disposal of such energy, the Commission shall give preference and priority to public bodies and cooperatives or to privately owned utilities providing electric utility services to high-cost areas not being served by public bodies or cooperatives.

I would like to read just one more sentence from this letter:

> In order that the arrangements for the sale of this power may be completed, it is requested that we be advised within the next 2 weeks, or sooner if possible, whether or not you are interested in purchasing this power.

This amounts to preference by ultimatum. How can a cooperative possibly indicate if it is interested in the purchase of this power when it does not know the price of the power, and also when it only has a period of 2 weeks or less to complete the necessary engineering studies and also discuss with REA the possibilities of being able to obtain this power? I also wish to call your attention to the rather stringent provisions contained in the last paragraph of this letter.

Our New York cooperatives are in one of the highest cost power areas in the Nation. In 1953 they paid 11.2 mills for their wholesale power. They are interested in anything which offers a possibility of being able to obtain lower-cost power, especially in a situation such as this, where the AEC has to dispose of power, which should be classified as dump power because it is so unfirm. A group of our New York State managers and also a representative of REA met with Mr. Anderson in Schenectady on January 28. I would like to read to you a few paragraphs from the letter which the manager of the cooperative at Delhi, N. Y., wrote to us after this meeting.

> Our first questions pertained to the price of the power. They said they had given some thought to this and could find no basis of arriving at a rate. We advised we needed that information first so we could study the possibilities of transmission through wheeling or other arrangements. * * *
>
> The attorney for the AEC said they were attempting to apply section 44 of the new Atomic Energy Act. He said there were two requirements: One the preference matter, the other the needs to sell the power at a reasonable price. He said all interested parties, public and private, should submit bids for the

power. (He did not say "sealed bids.") When the bids are in, the attorney said it might be obvious to them who should get the power. He said they did not know how to apply section 44 to this case, and felt a precedent might be established. * * *

We told them of past difficulties with the New York utilities (spite lines, and keeping our wholesale rates high so our retail rates would be higher than theirs). We said, if we submitted a price we would pay, Niagara Mohawk would submit a higher one to keep us from getting the power just as they built spite lines in prior years.

They asked us to make them an offer so they could decide who is to have the power and to give them ample time to work out a contract and have it approved in advance of July 30, 1955. With sale of power only an incidental in their operation, they wanted nothing to hold up their testing schedules. When they first called us January 13, they said it was hoped a decision could be made in 2 weeks.

That is the end of the quotation from his letter there.

I hope I have made the point that, No. 1, they do not seem to be anxious to cooperate with us, and No. 2, they do not permit us to get close enough to them to advise with them so that we can really cooperate with them, and so we are just in one hassel after another like this.

Senator HICKENLOOPER. In a case like this, are you assuming that the private companies are close enough to them so that they have information that that cooperative up there does not have?

Mr. ELLIS. Yes, sir; they admit it, right here themselves.

Senator HICKENLOOPER. I do not so understand that statement, but then I would be very interested if preference has been given on the basis of information given to anyone. In other words, it would seem to me that the information ought to open and aboveboard to anyone who can look at it.

Mr. ELLIS. I think I quoted here from Mr. Anderson's letter in which he said:

It is requested that we be advised if you are interested in purchasing this power. We have an offer from Niagara Mohawk, and we have also contacted a few other privately owned utilities which are nearest the site.

Senator HICKENLOOPER. That does not say that they have given them any more basic information than you people have. It says they have an offer, and your cooperative could have made an offer, but it would not be wise to make it without definite information. I do not read anything into that that these people have been given inside information that that cooperative has not had.

Mr. ELLIS. The fact is that the power companies knew about it before the cooperative did, and had been contacted before the cooperative had, despite the preference in the law.

Senator HICKENLOOPER. What is the date of that statement?

Mr. ELLIS. The date of Mr. Anderson's letter, and he wrote it immediately after a telephone conversation; this is Mr. Anderson's letter to Bob Donovon, manager of Delaware County Electric Cooperative, Delhi, N. Y., on January 19.

Representative COLE. I think the facts are in this particular case that General Electric, the manager of this experimental reactor, realized that it had a potential source of heat to generate electricity, and rather than see it go to waste thought it ought to be put to work. General Electric on its own negotiated and discussed the situation with the most likely users of that electric power because of the proximity of those users. Among them, as a matter of fact, I think the Niag-

ara Hudson is the nearest one of the utilities to this particular reactor. After discussions by GE with Niagara and the other nearby utilities, it was thought by GE that this proposal offered some prospect, and then it made its proposal or suggestion to the Commission.

Whereupon, the Commission, after it had evaluated the situation, undertook to carry out its responsibilities and made inquiries of other possible users. So that if there was any discrimination in preliminary negotiations, it was by GE and not by the AEC. I may be in error on that, but I think that that is the record of that.

Mr. ELLIS. I am sure you are correct, Congressman Cole, but it still all adds up to the fact that, no matter where we are in this program, we always come out last.

The account of this conference indicates to us that the AEC's idea of preference in this instance is that the power should be sold to the highest bidder. This, I believe you will agree, is not the meaning and intent of the preference clause of the 1954 Atomic Energy Act which we fought so hard to obtain.

If the AEC does nothing to firm up the power which they have available and does nothing to assist the cooperatives in negotiating for the purchase of this power either through wheeling or replacement agreements if necessary, I believe the preference provisions of the 1954 act will be meaningless. I wish to call your attention to section 9 of the second part of our atomic power policy statement (exhibit No. 1, p. 464). This reads as follows:

> The AEC should immediately spell out clearly the procedures by which it intends to effectuate its responsibilities under the power preference provisions to nonprofit electric systems set forth in the Atomic Energy Act of 1954. This statement should include procedures on notification of availability of power, firming power, wheeling, and other arrangements essential to preference rights.

This would be in accord with the manner in which the preference clause has been effectuated by other Federal agencies selling power under the preference clause. We hope your committee will thoroughly examine how the AEC is carrying out these preference provisions and direct the AEC to carry out this preference clause as it has been carried out so effectively, at least until recently, in relation to power marketed from the Federal hydroprojects.

Division of Civilian Power. I wish to call your attention to the fact that the AEC has not established a Division of Civilian Power application as authorized in section 25 (a) of the Atomic Energy Act of 1954. We believe it is absolutely essential that such a division be established in order that more attention can be devoted to civilian power, and also in order that adequate assistance can be made available to those interested in the applications for civilian power.

We realize that a lot of the time of the present Reactor Development Division must be devoted to military application. But at the same time, we believe we must not neglect civilian power research and development. It is awfully easy to do this when there are overriding considerations which require that this one division in the AEC which is concerned with atomic power development must spend a good part of its time on military research and development. We believe this need is emphasized by the recent announcement by Great Britain that it is embarking on a rather ambitious civilian power program, and also by the recent announcement by the Communist government of

Russia that it has several reactors which are now operating and producing electric power.

Our rural electric people would like to have an agency established in the AEC where they can come and discuss their civilian power problems. They would like to know that they are dealing with people who are devoting their time to these problems, and because of this have been able to acquire sufficient specialized knowledge to deal with them. We have been told that there is no need for such a division since General Tammero has been appointed as Assistant General Manager for Research and Industrial Development.

We think it fine that there is such high level dirtection to industrial development, but at the same time we believe that there also should be a division with adequate staff to carry out this direction. We hope that the committee will direct the AEC to establish such a division, and also an advisory committee on civilian power with adequate representation for the national organizations of the public and cooperative electric systems.

In section 2 of the second part of our atomic power policy statement our membership asks the AEC to take such action.

AEC personnel turnover: One of the difficulties we encounter in dealing with the AEC staff is that they have such a heavy turnover of personnel. It seems that almost every time we contact the Reactor Development Division someone else is, at least tentatively, in charge. For awhile we dealt with Dr. Petersen and then he left to join the Republic Steel Co. After that we dealt with Dr. Hafstad, and he left to join the Chase National Bank.

I guess it is only natural that these people should leave the Government to seek more lucrative private employment, but at the same time we feel that they have acquired considerable knowledge and experience through their Government employment, and they are of assistance to us while they are with the Government, but when they leave to go with such organizations as the Chase National Bank, Bozell & Jacobs, and so on, we can no longer benefit from their knowledge and experience. In fact their knowledge and experience may be used to fight the rural electrification program. We hope the committee will be able to come up with some means of at least slowing down this rapid turnover of personnel.

But we are even more concerned with the fact that some of these people are going to work with organizations which have fought the rural electrification program for years, and apparently they are going to work for these organizations and will retain their "Q" clearance.

Recently it was announced that Mr. Trapnell was leaving the AEC to accept a position with the firm of Bozell & Jacobs, and it also stated in the announcement that Mr. Trapnell would be retained by the AEC as a consultant.

On page 61 of the printed hearings, General Nichols states that he authorized the retention of Mr. Trapnell as a consultant, and that in this capacity, Mr. Trapnell would retain his "Q" clearance. Mr. Trapnell no doubt is a very fine man. But we certainly question the propriety of AEC retaining, as a consultant with "Q" clearance, a man who is working for the firm of Bozell & Jacobs.

Bozell & Jacobs, as you know, is a New York public relations firm in the employ of the private power companies. This outfit carries on

a constant propaganda barrage against the Federal Government's wholesale power development program.

I have before me a little booklet entitled, "The Electric Companies Public Information Program," prepared by Bozell & Jacobs. I want to show you the cartoon which appears on page 3 of this booklet. This cartoon is a vicious attack on the Federal power program which means so much to the rural electric systems. I want to read to you a few paragraphs from this booklet:

> The aim of this public information program is to tell the story of the investor-owned electric companies in simple terms so that the people of America can decide the issues in the fight against socialization of the industry.
>
> The people of this country traditionally do not believe in socialism, but the encroachment of Government in private enterprise is cloaked in no such words. It is sold with persuasive slogans.

This Electric Companies Public Information Program, conducted by Bozell & Jacobs, is a vicious propaganda organization of the private utilities who consider any sort of competition to be socialism. Of course, they never mention the fact that the Federal Government generates only about 13 percent of all the power in this country, and it sells it wholesale.

I would like to continue to read a little more from this booklet.

> Bozell & Jacobs, Inc., carries on the work of collecting, verifying, and distributing the informational material used (by the electric companies public information program) at all three levels—local, regional, and national. At news desks in New York and Washington offices, information pertinent to the industry is sifted, edited and written. * * *
>
> Bozell & Jacobs has been public relations counsel for power companies for 29 years and has worked with operating utilities in 38 States. It has offices in 11 cities which assist in the program.

We find it to be very interesting that a former AEC official, now in the employ of this firm, is also employed as a consultant to the AEC and retains his "Q" clearance.

We also know, according to the expenditure reports filed by Purcell Smith's National Association of Electric Companies, that Bozell & Jacobs, from time to time, has received sums of money from the National Association of Electric Companies for the purchase of publications. We also have heard that Mr. Trapnell is going to head an atomic energy division of Bozell & Jacobs which will be associated with the National Association of Electric Companies here in Washington. We certainly find such developments to be most disturbing, especially in view of the fact that we cannot even get proper representation of the farmers' rural electric systems on the AEC's public advisory committees.

Depositories for AEC documents: We are also interested in reading on page 16 of the printed hearings Dr. Libby's statement that in order to make copies of the AEC unclassified reports conveniently available to American industry, the AEC has established four industrial informational depositories. These include the Atomic Industrial Forum in New York, Stanford Research Institute in Stanford, Calif., John Crerar Library in Chicago, and Georgia Institute of Technology in Atlanta. We question the impartiality, for instance, of the Atomic Industrial Forum. I would like to read to you from page 5 of the report entitled, "Special Electric Companies Public

Information Program Study of Information Aspects of Nuclear Energy Development":

This material was prepared by and under the direction of Charles Robbins, head of the nuclear information division of Bozell & Jacobs, who, since 1951, has been studying nuclear energy with particular reference to its public relations aspects.

Further down on the page there is this note:

Since completion of this kit, Mr. Robbins has become executive manager of the Atomic Industrial Forum, Inc. * * *

Therefore, it would appear that Bozell & Jacobs was able to have their man appointed as executive manager of this Atomic Industrial Forum, Inc., which is one of the depositories for the unclassified AEC reports.

These are just a few of the many developments at the AEC which we find to be disturbing, and which, at the very least, will be roadblocks in our ability to participate in the program to develop this new technology.

Amendments to the 1954 act: I know the committee today is not primarily concerned with legislative changes needed in the 1954 act, but for the future consideration of the committee, I would just like to briefly present a few changes which the rural electric systems feel will improve the 1954 act.

We believe the Atomic Energy Act of 1954 should be amended to give preference to rural electric and public-power systems in the availability of nuclear fuels. We feel this preference may be more important than the preference which we obtained in the act for the granting of a license to construct a nuclear powerplant. At the Atomic Industrial Forum in New York in November 1954, Prof. William A. W. Krebs, Jr., associate professor, Massachusetts Institute of Technology and former general counsel, National Science Foundation, stated:

The statute also provide that if there are conflicting applications for a limited opportunity for a facilities license for power generation, preferred consideration is to be given to facilities to be located in high-cost United States power areas and to applications submitted by public or cooperative bodies.

Since the principal conflict is likely to arise over competing applications for special nuclear material, that being the item in short supply, it seems reasonable to believe that these provisions for preference, although they are nominally applicable to facilities-license applications, will be most significant as guides to AEC in distributing the special nuclear material in connection with the portion of this overall transaction that I described earlier.

I think this amply points to the fact that there is need for preference in the availability of nuclear materials.

We believe the Atomic Energy Act should be amended to provide for compulsory licensing of all atomic patents for an indefinite period of time, and not just for the limited compulsory licensing of patents affected with the public interest for a period of 5 years, as contained in the 1954 act. Mr. Charles Fain, of our staff, will discuss this in a little more detail later.

We believe the 1954 act should be further amended to authorize the AEC or any Federal power agency to construct nuclear powerplants to generate commercial atomic power for sale at wholesale. This, of course, is the old Johnson amendment which would have added a new section 45 to the act. This amendment will require the repeal of the last sentence in section 44 which reads:

Nothing in this act shall be construed to authorize the Commission to engage in the sale or distribution of energy for commercial use except such energy as may be produced by the Commission incident to the operation of research and development facilities of the Commission, or the production facilities of the Commission.

We believe the enactment of this new section and the repeal of this sentence in section 44, absolutely essential to permit the establishment of yardstick atomic powerplants to determine what the cost of producing and distributing atomic power really is.

We would also like to see the Atomic Energy Act amended to make it compulsory for the AEC to establish a division of civilian power application, and appoint an electric power advisory committee with adequate representation for public and cooperative systems.

I am sure your committee is tired of having to devote so much time to the Dixon-Yates deal. I am sure your committee would also like to prevent such deals in the future. Our membership strongly opposes the Dixon-Yates contract as the attached resolution (exhibit No. 5, p. 468) unanimously adopted at our recent annual meeting in Atlantic City shows. We believe the Congress should repeal the portion of section 164 of the Atomic Energy Act of 1954, the Ferguson amendment, which attempts to legalize the Dixon-Yates contract.

We would like to see the Congress authorize the appropriation of funds for the construction of large demonstration nuclear powerplants in areas where the AEC is consuming a large part of the available power supply. To us it seems very logical that the AEC should construct these demonstration plants itself, and also sell the power itself. The construction of such yardstick plants should give the American people a pretty good idea of what the cost of atomic power will really be.

Also, it would relieve the tight power situations which exist in some of these areas where the AEC is consuming a major portion of the available power supply. Such an arrangement certainly is preferable to the Dixon-Yates type of deal, which would tend to destroy the TVA yardstick and increase the cost of power in many areas of the country, not just in the Tennessee Valley.

I wish to call your attention to section 7 of the first part of our statement of atomic power policy (exhibit No. 1, p. 464). This section reads as follows:

Direct the AEC to construct and operate several small to large scale experimental reactors immediately to supply power to AEC's own operations.

This statement, which was adopted unanimously by our membership at our recent annual meeting, would, for instance, place us strongly behind such measures as the bill introduced by Senator Gore on February 11, 1955, to authorize the appropriation of funds for the construction by the AEC of an experimental facility for production of nuclear power from nuclear fission.

We believe the AEC should be given such authorization and also that funds should be appropriated for this purpose. We believe that limited construction by the AEC itself is more desirable than the subsidy which will be given private industry through the demonstration power-reactor program. We believe it would not only be more economical, but would give us a better indication of the actual costs of the generation and production of atomic power.

From such construction, the AEC should be able to derive a real atomic-power yardstick which could be used to measure the cost of

commercial atomic power. We feel the Joint Committee and the Congress would be performing a real public service by approving S. 1049. We hope your committee will hold hearings on this bill in the near future, and at that time we would like to have the privilege of testifying.

Throughout our presentation we have mentioned areas where the rural electric systems need assistance to get into this atomic-power program. We believe REA must take the lead in providing technical assistance for the rural electric systems to participate in the atomic-power program.

At the same time, we believe the AEC can render additional assistance. We feel we will stand a much better chance of getting AEC assistance if the Joint Committee directs the AEC to take certain action.

We hope your committee will see fit to direct the AEC to provide technical assistance in addition to what REA should provide, to make the rural electric study group a really effective group which can perform a real service to the rural electric systems.

We trust the Congress will appropriate any additional funds necessary to provide adequate staff at the AEC to perform these services for the rural electric systems. Also, we hope the Joint Committee will see fit to direct the AEC to give increased attention to the development of small civilian reactors which can contribute to the solution of some of the wholesale power problems faced by the rural electric systems.

Perhaps in connection with this the committee might direct the AEC to assist the rural electric systems in submitting proposals under the demonstration power-reactor program. Without considerable assistance. I do not see how our systems can possibly participate in this program. Even with such assistance, it is questionable if they will be able to participate, as I have previously mentioned.

We want to participate in the atomic-power research and development program to the fullest extent possible, and we hope that this committee will make clear to the AEC that it should do everything possible to assist the rural electric systems.

We feel the atomic-power program is now facing a real crisis. The program can be developed for the benefit of all the people, but, if present trends continue, we feel it will be developed principally for the benefit of a few great corporations. Real progress in the electric industry in the past, in my opinion, has not been due so much to any public interest on the part of these corporations, but has been due mainly to the element of competition.

We feel it is most essential that this small element of competition be preserved in this new source of energy which may actually be the dominant source of electric power in a few years. The farmers must not wait as long to share in the benefits of nuclear power as they had to wait to share in the benefits of central-station electricity.

(The exhibits referred to are as follows:)

EXHIBIT 1

RESOLUTION ADOPTED AT THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION ANNUAL MEETING, FEBRUARY 17, 1955

Whereas we are entering a period in which much of our electrical energy will be generated from nuclear fuels; and

Whereas the people of this country have already spent over $13 billion on the atomic energy program development; and

Whereas if this great new energy resource is to be developed and utilized for the benefit of all the people rather than pave the way for profiteering by a few; and

Whereas the United States is engaged in a race with the Soviet Union in the development of peacetime uses of atomic energy as well as military uses and that the one may well be as important as the other in the years ahead: Now, therefore, be it

Resolved, That NRECA, the member systems and our allies in other organizations press for the establishment of Federal atomic energy policy which will insure the rapid development of low-cost power from a program of action which will include participation by public, cooperative and private power agencies, and that the same protection of the public welfare long established in another field of public resources, that of water power, be extended to this new source of energy, and that to implement such principle the following policies and legislation be supported:

LEGISLATIVE PROGRAM

The Atomic Energy Act of 1954 should be amended to—

1. Make compulsory the establishment of a civilian electric power development and distribution administration which would be responsible to the Congress and the people for the rapid development and distribution of atomic power, and that this administration should be required by law to appoint consultative committees on which there would be representatives from private, public, and cooperative organizations of the electric industry, and that these committees be kept informed and serve in an advisory capacity to the administration and thus be a source of informed opinion to the Congress, the electric industry, and the general public;

2. Provide for compulsory licensing of all atomic patents and extension of the licensing period for an indefinite time, and fix patent rights to discoveries as a part of the public domain;

3. Authorize any Federal power agency to construct Federal atomic yardstick plants with funds appropriated by the Congress (the Johnson amendment);

4. Give preference to nonprofit power systems to nuclear fuels;

5. Direct the AEC to cooperate with REA and the rural electric systems to make possible full participation by the rural electric systems in the atomic energy program;

6. Direct the AEC to give adequate and increased attention to the development of small reactors readily adaptable to rural electric and municipal systems;

7. Direct the AEC to construct and operate several small- to large-scale experimental reactors immediately to supply power to AEC's own operations;

8. The AEC should be urged to provide adequate technical assistance to an NRECA or joint REA–NRECA study team and request additional funds from the Congress for that purpose if necessary.

AGENCY POLICY AND ACTION

And further, in terms of agency policy and action, NRECA and the member systems and our allies in other organizations should press for the following agency policies and actions:

1. REA should budget funds and personnel for the benefit of REA borrowers, to make possible full joint participation with NRECA in the atomic energy study program and keep all systems fully informed;

2. The AEC should carry out the intent of the Atomic Energy Act and establish a division of civilian power development without waiting for Congress to make it mandatory, and the recently appointed consulting committee should be broadened to include additional representatives of the rural electric systems;

3. The AEC should be urged as a matter of administrative policy to devote more funds and personnel to the specialized needs of the rural electric systems;

4. The AEC should actively encourage and assist rural electric systems in submitting proposals for development and experimentation so as to actively encourage competition in the atomic energy program. The AEC should recognize its continuing primary responsibility that most of the ex-

perimental work on power reactors should be carried on directly by the AEC in order that patent rights to the processes should become part of the public domain and not a source of inordinate profit or bottlenecking in the hands of private groups;

5. The AEC should abandon the largely fallacious view that the subsidies being granted to private corporations by the AEC and ODM are more economical to the people and the Government than an outright subsidy through the AEC for reactor development, and that the AEC should recognize that their present and past policies in this area will result in concentration of control, special privilege, and monopoly in the program;

6. The AEC should immediately seek funds to construct one or more large demonstration reactors to serve its own needs at large atomic installations as this is already legal under the law;

7. The AEC should cease making basic policy decisions in the atomic-power program without adequate representation of rural electrics, municipal and Federal power systems, as these policies being established are almost as important as legislation, and there is every evidence that the private power companies are already being consulted while other groups are excluded;

8. The AEC should make every effort to reduce the area of information circumscribed by security restrictions in order that the public, including our systems without cleared personnel, may have the advantage of a maximum of information on prices of materials, costs, techniques, subsidies, and other information vital to understanding;

9. The AEC should immediately spell out clearly the procedures by which it intends to effectuate its responsibilities under the power preference provision to nonprofit electric systems set forth in the Atomic Energy Act of 1954. This statement should include procedures on notification of availability of power, firming power, wheeling, and other arrangements essential to preference rights; and be it further

Resolved, that the NRECA board of directors instruct the Atomic Energy Committee of our staff to watch this whole atomic program carefully and keep our people and the Members of the Congress informed on developments and needs; and, further,

That the association management be authorized and delegated to authorize such staff personnel and to obtain additional services as necessary to adequately keep abreast of atomic-power-program developments, provided it is understood that budget is not now available for extension of services in this direction.

EXHIBIT 2

Estimated input of kilowatt-hours of energy of REA borrowers by calendar year, 1943–63 [1]

Year	Input in kilowatt-hours (billions)	Percentage increase over preceding year	Year	Input in kilowatt-hours (billions)	Percentage increase over preceding year
1936	[2] [3]		1950	8.308	23.0
1937	[2]		1951	10.241	23.3
1938	[2]		1952	11.991	17.1
1939	[2]		1953	13.890	15.8
1940	[2]		1954	[4] 15.480	[4] 11.5
1941	[2]		1955	16.810	9.6
1942	[2]		1956	18.150	8.0
1943	1.920		1957	19.480	7.3
1944	2.188	14.0	1958	20.820	6.9
1945	2.417	10.5	1959	22.160	6.4
1946	2.817	16.5	1960	23.490	6.0
1947	3.812	35.3	1961	24.830	5.7
1948	5.232	37.3	1962	26.170	5.4
1949	6.782	29.6	1963	27.500	5.0

[1] Actual input through 1953; estimated for 1954–63. Input excludes power produced for resale to non-REA borrowers. Source: REA.

[2] Not available.

[3] Data for years 1936–42 not available on comparable basis. Gross input for earlier years destroys comparability because data on energy generated for resale to non-REA borrowers is not available.

[4] In the 5-year period 1949–53, inclusive, energy input more than doubled (1953 was 105 percent of 1949).

EXHIBIT 3

Wholesale power costs of rural electric systems for year ending June 30, 1953, in order of decreasing cost

[Official REA figures]

State	Cost per kilowatt-hour [1]	State	Cost per kilowatt-hour [1]	State	Cost per kilowatt-hour [1]
	Cents		*Cents*		*Cents*
Alaska	2.88	West Virginia	.96	New Mexico	.69
Maine	1.54	Missouri	.95	Georgia	.64
Minnesota	1.40	Florida	.88	Oklahoma	.60
New Jersey	1.39	Nebraska	.88	Arkansas	.60
Utah	1.39	Ohio	.86	Texas	.58
Wisconsin	1.37	Indiana	.86	Alabama	.58
Michigan	1.28	Colorado	.86	Arizona	.56
Iowa	1.26	Illinois	.84	Louisiana	.55
Vermont	1.23	Kansas	.82	Mississippi	.53
New Hampshire	1.23	Kentucky	.79	Montana	.48
Delaware	1.22	Wyoming	.76	Tennessee	.48
South Dakota	1.17	North Carolina	.76	Idaho	.47
North Dakota	1.12	Virginia	.72	Nevada	.42
New York	1.12	California	.72	Oregon	.37
Pennsylvania	1.05	South Carolina	.71	Washington	.31
Maryland	1.02				

[1] The United States average is 0.78 cent.

EXHIBIT 4

UNITED STATES ATOMIC ENERGY COMMISSION,
Schenectady, N. Y., January 19, 1955.

Mr. R. N. DONOVAN,
Manager Delaware County Electric Cooperative, Delhi, N. Y.

DEAR MR. DONOVAN: As discussed with you by telephone, a quantity of excess electrical power will be available for disposal late this coming summer at our West Milton site located about 18 miles north of Schenectady, N. Y. As required by the Atomic Energy Act of 1954, the Atomic Energy Commission will give preference and priority to public bodies and cooperatives in the sale of this power. Accordingly, it is requested that we be advised if you are interested in purchasing this power. We have an offer from Niagara-Mohawk and we have also contracted a few other privately owned utilities which are nearest the site. After we determine which of the privately owned and preference utilities, if any, are interested, it is planned to contact interested parties relative to establishment of a rate and selection of a buyer. In order that the arrangements for the sale of this power may be completed, it is requested that we be advised within the next 2 weeks, or sooner if possible, whether or not you are interested in purchasing this power.

The power will be available at bus bars at the West Milton site at 33,000 volts 3-phase, 60 cycle alternating current. This power is a byproduct of the operation of a development facility and as such will not be firm power. The amount of power will vary from 0 to 10,000 kilowatts. It will not be possible to schedule the amount of power available or the time and period that this power will be available. It is anticipated that as much as 6 million kilowatt-hours of energy per year may be available, but it will not be possible to guarantee any given amount of power will be available. It is expected that this power will be available beginning in the latter part of this summer and will continue for a period of three years.

The sale of this power will be subject to the following conditions:

1. The purchaser must be ready to receive this power late this summer (July 30, 1955).
2. All of the excess power available must be purchased.
3. The Government is not obligated to provide any amount of power at any time or for any period.
4. The power must be accepted at the site, and the purchaser must make all arrangements for transmittal.

Sincerely yours,

J. D. ANDERSON, *Manager.*

EXHIBIT 5

RESOLUTION ADOPTED AT THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION ANNUAL MEETING, FEBRUARY 17, 1955

Whereas the so-called Dixon-Yates contract was negotiated and consummated in secrecy and without competitive bidding; and

Whereas performance of the Dixon-Yates contract will cost the Government and, therefore, the taxpayers of the country, in excess of $100 million more than if TVA were permitted to build its own plant; and

Whereas under the guise of contracting with private industry, the Dixon-Yates contract provides for the paying of a huge subsidy to two giant utility holding companies for the purpose of causing the encirclement, curtailment, and eventual destruction of TVA; and

Whereas the Tennessee Valley Authority has served as a rate yardstick with enormous benefits to the whole United States, at the same time paying a return to the Government averaging 4 percent a year; and

Whereas over half of TVA's low-cost power goes to atomic-energy plants and other defense agencies at a saving of many millions of dollars to American taxpayers, further proving TVA to be a national asset and not a project of purely local value; and

Whereas the dispute over the Dixon-Yates contract has plunged the Atomic Energy Commission into the middle of a political controversy having no relationship to its important functions, and will continue to interfere with the important and necessary work of that Commission: Now, therefore, be it

Resolved, That we urge the Atomic Energy Commission to cancel the Dixon-Yates contract; that we further urge the Congress of the United States to prevent the consummation of the contract by the denial of appropriations therefor; and that we further urge that Congress appropriate for TVA the necessary funds for the construction of a steam-generating plant by TVA at Fulton, Tenn.; be it further

Resolved, That copies of this resolution be sent to the Atomic Energy Commission and all Members of the House of Representatives and Senate.

Mr. Chairman, at a later date I hope we may be permitted to come before you and discuss what we think are some very greatly needed amendments to the Atomic Energy Act.

Chairman ANDERSON. That will be done.

Just let me say this: We are going to be concerned with amendments to the Atomic Energy Act, but right now we are very anxious to try to finish this survey we are supposed to make in the first 60 days of our session.

You will not be foreclosed from an opportunity to discuss these suggested amendments to the act. I can promise you that.

Mr. ELLIS. Let me say one word about patents. We hope you will give early consideration to the patent problem.

I view this patent picture, if it were charted on a great chart here, as the blank line running away high, of the people's investment in this program.

Unless you consider before long some of the patent revisions, we fear that certain groups are going to come in, and you will barely be able to see them if they were put in gray upon top of that great black line on the chart. You would barely be able to see them there. And yet they are going to be able to corner patents, and we fear that certain things will happen which are not in the public interest.

Charley Fain, who is our legislative assistant, who is also an attorney, had prepared a statement which I believe you have already agreed he may file.

May he take 1 minute? We will still come within 4 o'clock.

Chairman ANDERSON. Surely.

STATEMENT OF CHARLES J. FAIN, LEGISLATIVE ASSISTANT, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. FAIN. Mr. Chairman, I could not do anything more than simply make a very brief statement in 1 minute. I will try to do that.

My name is Charles Fain, and I assist Mr. Ellis in legislative matters. Primarily we are concerned today with bringing to your committee a point of view which we think represents a large segment of the rural population in this country. We did not prepare this statement with the thought in mind that we would furnish you technical information on the patent provisions, because naturally we realize that you have much more information on that field than we do.

But I would simply like to say that the statement which I have prepared I believe reasonably represents a point of view and an attitude on the part of our people toward the patent provisions in the new act.

With that thought in mind, I would like to leave it with the committee for your study, and I hope that at a later date if there are any amendments to the act pertaining to patents, that we may be allowed to go into them in some detail with the members of the committee.

I want to thank you very much for the opportunity of appearing before you and leaving this statement with you.

Chairman ANDERSON. I want to assure you that we will make absolutely sure that you do have a chance to appear. I have just asked Mr. Allardice to make very sure that there is no slip on this at all.

Now, there are people on both sides of this patent question. Some think we went too far and some think we did not go far enough, and so we are bound to have it up for consideration. Furthermore, there was a commitment made before the conference report was agreed to, that there would be a special study of patents and a special hearing on it, and there will be. At that time there will be ample opportunity given for you to prepare to be here and then to be heard once you are here.

(The statement referred to is as follows:)

STATEMENT OF CHARLES J. FAIN, LEGISLATIVE ASSISTANT, NATIONAL RURAL ELECTRIC COOPERATIVE, BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY, FEBRUARY 28, 1955

Mr. Chairman, members of the committee, my name is Charles J. Fain, legislative assistant to Mr. Clyde T. Ellis, general manager, National Rural Electric Cooperative Association. I wish to take this opportunity to thank the members of the committee for hearing the views of our association. I also wish to extend our thanks to the committee for the fine cooperation we have received from your committee staff. During the past year we have had many occasions, oftentimes beyond the normal workweek, to call upon your staff for information and direction. We have found them to be understanding and willing to aid us in every possible way at their disposal.

As Mr. Ellis covered the general views of the association in this field, I shall confine my statement to a few brief remarks on the patent provisions in the present act. I shall not attempt to cover the matter in detail as that can await the time specific proposals for change, if any, are considered by your committee. However, we do feel a few general remarks on the subject of atomic energy patents are pertinent at this time, especially as testimony has been already presented to you advocating far-reaching changes in the patent provisions of the Atomic Energy Act of 1954.

At the outset it may be of interest to the committee to have an expression of our views toward patents in general. From the early beginnings of this Republic, Congress has expressed a policy of awarding the inventiveness and ingenuity of individuals by granting exclusive rights to those writings and discoveries which were uniquely their own—a product of their own minds, hands, and substance. Our Founding Fathers recognized the importance to the Nation's progress in the useful arts and sciences by granting such power to Congress in our Constitution. Under that constitutional authorization, technological progress has been made by the promotion of a sound Federal patent system. This system has provided great incentive to the inventor to really set his mind and hands and resources to work, and to make the products thereof available to the general public by granting him exclusively rights to the use of that product for limited times. This has undoubtedly resulted in making products available which would otherwise have remained locked in the mind and heart of their creator. And, generally speaking, in exchange for this exclusive privilege for a limited time the inventor has, as the quid pro quo on his part, let his idea, his invention, pass into the general reservoir of knowledge for the use and good of all. Such it has been, and in the normal sense of things, such it will undoubtedly remain in our competitive free enterprise system—and rightly should.

I think all of us can agree with Abraham Lincoln when he said:

"In the world's history certain inventions and discoveries occur of peculiar value, on account of their great efficiency in facilitating all other inventions and discoveries. Of these were the art of writing, printing, the discovery of America, and the introduction of patent laws."

He said further that the patent system "added the fuel of interest to the fire of genius in the discovery and production of new and useful things."

At this point is might be well to recall that Congress, under the constitutional authorization, was in one sense granting the patentee a right or privilege which he did not enjoy at common law. This was the exclusive element involved in the grant. At common law the inventor had the right to make, use, and sell his product to the general public and exclude all others from doing so only so long as he, himself, was able to retain the secret. In other words he had no exclusionary right other than what he could attain by secrecy. When Congress gave him this exclusive right to his invention for a limited period of time, it thus conferred upon him certain rights he did not have beforehand and in doing so a price was exacted of him—that price being that such information would pass to the general public at the termination of the patent period. A second point to keep in mind is that such was not granted for the inurement and relief of the individual inventor, but rather to make such information useful and eventually completely available to the general public, or what has usually been termed for the general welfare—for the common good. Justice Daniel in *Kendall* v. *Winser* made this clear when he stated:

"It is undeniably true that the limited and temporary monopoly granted to inventors was never designed for their exclusive profit or advantage; the benefit to the public or community at large was another and doubtless the primary object in granting and securing that monopoly. This was at once the equivalent given by the public for benefits bestowed by the genius and meditations and skill of individuals, and the incentive to further efforts for the same important objects."

With the advent of atomic energy a new concept was introduced into our traditional free-enterprise system. I need not dwell on the details of that concept, before this committee especially, other than to state it. It was that the Federal Government, at its own and exclusive expense, developed an entirely new industry. From its very inception the production and utilization of nuclear energy was a Government project—born, nurtured, and reared to its present stage of development at Government expense.

Recognizing this fact and the need for the defense and security of the Nation, Congress provided in the Atomic Energy Act of 1946 for either Government ownership of patents in this field or, in the nonmilitary utilization of atomic energy, the Commission was given the duty to declare such patents affected with the public interest. The objective being to hasten civilian uses in the field by making every important phase of the art available to all on an equal basis. At the same time proper provision was made—and exists in the new act as well—for compensation to those individuals whose discoveries were licensed to the general public. Thus, this incentive to the individual, of which we have spoken earlier, was retained either at the expense of his Government or the licensee, just as incentive was recognized long ago in our general patent

laws. But incentive was provided without creation of a bottleneck stifling equal use to all in the field.

Although the McMahon Act, as written, spoke in terms of a mandatory duty upon the Commission in regard to patents affected with the public interest, there was actually a discretion in the Commission under section 11 (c) (1) (b) of the act of 1946. This was in essence a reserve power by which Congress could insure that all segments of the people were given equal opportunity to use this information developed at the expense of the general public. This is the provision commonly referred to as compulsory cross-licensing. It is a provision which the National Rural Electric Cooperative Association has endorsed as being in the public interest in general and particularly in the interest of its rural electric systems in this transition period of atomic energy.

The reasons for our conviction in this matter of compulsory cross-licensing—always remembering that we strongly advocate that proper compensation for such license should be made by the licensee—are twofold. The first has already been stated above in that this vast reservoir of knowledge out of which these patents will grow has been collected at the expense of the public. That needs no further comment as it is a matter with which this committee is thoroughly familiar.

Secondly, we feel that to not provide for an opportunity to obtain such licenses may very well work a hardship on the rural electric systems as matters now stand, Mr. Ellis has spoken to you at length on the desire and interest of our people in the field of nuclear power. He has also pointed out the difficulties they have and are now encountering in breaking into this field. And not only are they now excluded but it appears to us that it will be some period of time before they can get a proper perspective of the possibilities of nuclear power. Thus, as things now stand, what will happen to their opportunity to generation in this field if they find that exclusive patents have been granted to others in this development period? To ask the question is to answer it.

It may be said that the new Atomic Energy Act of 1954 furnishes adequate protection for such in sections 152 and 153. First of all, section 152 clearly provides that the Commission may waive its claims under this section. In this regard, it would undoubtedly be pertinent to determine which inventions and discoveries are being waived and which are being retained by the Commission under section 152. The committee might also wish to consider whether there should be an opportunity for intervention by interested parties before such waivers are granted.

As to section 153 our main concern is that there cannot be as much assurance of licensing opportunities as under the 1946 act, which was repealed by the 1954 act. Fundamentally, the difference between this section and section 11 (c) (1) of the former act is a shift of emphasis. Under the prior statute the Commission had the duty to so declare patents affected with a public interest and make them available for licenses, whereas under section 153 not only is it discretionary with the Commission but a heavy burden is placed on the prospective licensee to achieve such declaration and then the license.

Yes, the emphasis has shifted from the safeguarding of equal opportunity for all in this field to that of making it difficult for the prospective licensee. This is a matter that is very difficult to pass judgment on, but it is our hope the Commission will adopt a militant attitude in carrying out section 153 in order that the rural electric systems, and possibly the general public as well, will not be excluded from the use of inventions essential to their economic use of nuclear power.

Section 153 (h) is also of concern to us. This section limits to a 5-year period the right of the Atomic Energy Commission to license patents in any respect. We feel, from the experience the rural electric systems are having in this field, that a 5-year limitation is entirely too short. It is our hope that your committee will be able to ascertain from the progress being made in the field of nuclear power whether this period should not be extended. This is a matter of opinion, naturally, and will vary greatly, but we feel at this time that the compulsory licensing period should be extended indefinitely with the idea that some future Congress could decide on a cutoff date—either gradual or limited.

We believe this not only because this is a great new industry brought into existence by the Government, but also because in bringing it in the American people have invested billions of dollars of their own money. In contrast, corporations and individuals together have invested relatively little. It simply would not be fair for a relatively few corporations or individuals possessed of

the great knowledge that has come about, only because of the Government's investment, to corner the market and stifle use by all simply because of coming upon some invention essential to the development of this great new industry for the econmic good of all—including the economic strength of our Government in the international atomic power race.

I repeat a sentence that was contained in Mr. Ellis' statement from the resolution adopted by the rural electrification people at their recent national annual meeting in Atlantic City, N. J., wherein they ask that the Atomic Energy Act of 1954 be amended to "provide for compulsory licensing of all atomic patents and extension of the licensing period for an indefinite time, and fix patent rights to discoveries as a part of the public domain."

The rules and regulations being promulgated by the Atomic Energy Commission to effectuate these various patent provisions in the new act are of interest to us. We are very hopeful that the rural electric systems, constituting a respectable segment of the utility industry, will be able to express their views to the Commission on this subject with the same opportunity as other segments of the utility industry.

CONCLUSION

I trust it is evident to the committee from the statement made by Mr. Ellis that the rural electric systems are anxious to participate in the development of nuclear power. And well they might as economies in costs of fuel mean a great deal to them in making their systems economically feasible. They are anxious to do their part to hasten the day when civilian uses of atomic energy will be the dominant part of the program. In this, our association heartily agrees with the objective expressed by the President in his message to Congress on February 17, 1954. But we also concur and endorse his further admonition when he stated:

"Until industrial participation in the utilization of atomic energy acquires a broader base, considerations of fairness require some mechanism to assure that the limited number of companies, which as governmental contractors now have access to the program, cannot build a patent monopoly which would exclude others desiring to enter the field."

We are hopeful this committee will exert every effort to insure that such is done.

And as Abraham Lincoln recognized the patent system as ranking with the invention of writing and printing, may we all recognize, as undoubtedly this committee does, that the possibilities of peacetime uses of atomic energy rank with man's greatest discoveries. In order to bring it to fruition, new patterns of thinking are undoubtedly necessary, just as the Founding Fathers of our constitutional form of government determined that a new pattern was necessary in regard to patents thereby introducing an entirely new concept into that field of law. This will no doubt be true in the field of patents as in many other areas of government in this atomic age.

Mr. ELLIS. May I ask Mr. Cochran to make one statement?

Chairman ANDERSON. Go right ahead, Mr. Cochran.

STATEMENT OF CLAY L. COCHRAN, STAFF ECONOMIST OF THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. COCHRAN. I am Clay Cochran, staff economist for NRECA. My statement that I am submitting is very brief. What it boils down to is this: Much of the discussion of the experimentation that is being carried on in this field seems to be based on the assumption that there are private groups that are willing to put up considerable amounts of money to carry out this research. This, of course, would entitle them to certain rights and opportunities. But based on the Duquesne Light Co. contract, there is evidence that AEC is paying a good portion of the expenses directly out of its funds and that the Office of Defense Mobilization through the issuance of a tax-amortization certificate is going to permit Duquesne to reimburse itself for most of the other expenditures, so that you have a direct and indirect subsidy.

We are just hoping that the committee will keep this in mind in the future, in permitting groups to get into the program, and advise AEC that when they are telling a group of farmers, as they did last fall, that Duquesne got the contract because it was such a good deal for the Government, that they ought to count up all of the subsidy and not just part of it.

Thank you very much.

(The statement referred to is as follows:)

STATEMENT BEFORE THE JOINT COMMITTEE ON ATOMIC ENERGY BY CLAY L. COCHRAN, STAFF ECONOMIST, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION, FEBRUARY 28, 1955

Mr. Chairman, we are greatly concerned about the attitude the Atomic Energy Commission is taking as regards the financing of experimental reactors. Last fall our NRECA atomic energy committee talked with Mr. Nichols, Mr. Davis, and others at some length about the possibility of getting an experimental reactor on the lines of one of our rural electric systems. First, they wanted to make sure that we did not want one of their smaller reactors which they were using for laboratory purposes. They urged us not to "use political influence" to get one of these moved because, they insisted, moving these experimental reactors away from the big AEC laboratories and technicians would slow progress in experimentation and make it more expensive. We assured them we had no desire whatsoever to interfere with or slow down technical progress in this field, that our interest was in the opposite direction. But, we continued to press for information on the possibility of getting an experimental reactor on the lines of one of our systems. At this point, Mr. Nichols told us that the Commission would build experimental reactors in cooperation with whatever groups would give the Government the "best deal."

We asked him if that explained the Duquesne Power Co. contract, and he said that that was the right interpretation, i. e., that Duquesne offered to bear more of the expenses than any other bidder. It goes without saying, of course, that none of the rural electric systems were "bidders" because we had been so effectively shut out of the program that we could not possibly have bid on that deal, but it is also perfectly clear that our systems could not put up even the $14 million which Duquesne had promised to put up. Our systems are too small; their funds must come from REA which cannot lend unless it establishes economic feasibility. We took the view then that we take now, that if the atomic energy program is to be put upon the block that it will be bought by the great corporations, and we also feel most strongly that in a sense the AEC is in the process of putting that program on the auction block when it takes Mr. Nichols' view of the matter.

But, and we did not know this when we were talking with Mr. Nichols last fall, the situation is actually much worse than we thought it was when Mr. Nichols announced that this great program was going to the highest bidder, the highest bidder of a small percentage of the cost. We did not know that in addition to the great subsidies to be given Duquesne by the AEC that Duquesne was also going to ODM for subsidies to cover all, or the greater part of, their total expenses in this experiment. And that is what they did, as you know, and as AEC knew at the very time Mr. Nichols was praising the Duquesne contract as a bargain for the Government. Duquesne applied to ODM for a rapid tax amortization certificate covering their construction expenses under the Duquesne-AEC contract, and AEC granted them a 75-percent tax writeoff certificate.

Surely a subsidy is a subsidy whether it is paid out of the AEC till or is subtracted from Treasury receipts, and we can see no merit whatsoever in the AEC contention that it is a bargain for the Government to have a corporation collect its subsidy in two parts, one from AEC and the other from the Treasury. It was with this in mind that our people passed a resolution at our recent national annual meeting at Atlantic City which reads, in part:

"The AEC should abandon the largely fallacious view that the subsidies being granted to private corporations by the AEC and ODM are more economical to the people and the Government than an outright subsidy through the AEC for reactor development, and the AEC should recognize that their present and past policies in this area will result in concentration of control, special privilege, and monopoly in the program."

We think it not only possible that this great program can be handed over to a few big corporations, but that those same corporations can be paid a handsome subsidy for receiving one of the greatest discoveries in the history of man. We certainly do know that under the accelerated tax amortization program which began in June 1951, ODM has given the private electric companies a total of over $840 million in interest-free loans on which the ultimate returns or benefits or subsidy will amount to over $2.9 billion. I would remind the members of this committee that the total REA loans advanced to our systems total less than $2.5 billion ($2.48 as of September 30, 1954). This means that ODM in about a 3-year period has given interest-free loans to the private companies equal to over one-third of the total interest-bearing loans advanced to our systems by REA since 1935.

Operating in the marginal rural areas as the rural electric systems do, we cannot hope to hold our own with the private power companies if this general subsidy is continued. And in the atomic energy program, our little nonprofit systems cannot possibly participate in development and use of atomic energy if we are compelled to secure funds and pay interest while the private power companies collect their costs from one Government till or another.

We hope this committee and the Congress will take action to see that concealed subsidies are not used to deny participation in this program by the cooperative and local publicly owned systems. We hope you will review AEC policies in this field and insist that AEC officials learn the arithmetic of tax amortization as well as that of direct subsidy. In all future contracts the item of tax amortization subsidy should be given consideration at least, although we would actually strongly prefer that the Congress deny accelerated tax amortization certificates to the electric utility industry altogether.

Senator HICKENLOOPER. Now, Dr. Cochran, that plant is costing somewhere around $1,800 a kilowatt capacity. That is in total. I understand that the average powerplant in this country can be built now for steam production, let us say, for somewhere around $140 to $160 a kilowatt. That plant is costing 10 times as much per kilowatt capacity as steam plants can be built in the average fuel availability area in this country. So that even with considerable writeoff, that is going to be very, very expensive power to produce. It is not competitive at all in any way so far as I can see.

Mr. COCHRAN. I am sure that that is true, Senator Hickenlooper, and I think for a considerable period in the future most of these plants will have to be very heavily subsidized. But we would like for the Commission to look directly at the subsidies, and not consider that point——

Senator HICKENLOOPER. I have looked into that to some extent, and I am convinced that Duquesne in spite of the fact that the Government is putting up perhaps $2 to Duquesne's $1, or something of that kind, and in spite of the fact that there are certain writeoffs on the part of Duquesne, that they are not getting any bouquet of roses in this plant. I do think that because of the size of their operations, and the total number of kilowatt-hours that they put out through their entire system, they can absorb a small amount of very expensive electricity in there and not really reflect it in their kilowatt-hour operation charges throughout their entire system. But by the same token, I am thoroughly convinced that the kilowatts produced from that plant are going to be very costly kilowatts, although a few in number for Duquesne and by any kind of an analysis.

Mr. COCHRAN. That is right, and most of the cost will be borne by the Government. That was our point.

Representative VAN ZANDT. There was another point, the Duquesne people are going to be able to dispose of heat that they are going to produce, and that should be taken into consideration, and then the

availability of Westinghouse Electric right nearby, who are going to build the reactor.

Chairman ANDERSON. I think it would be of advantage to the Government if they would announce in advance that they are going to give a tax writeoff. However, it is a very expensive plant.

STATEMENT OF BRICE O'BRIEN, ASSISTANT COUNSEL OF THE NATIONAL COAL ASSOCIATION (ACCOMPANIED BY DR. FORD K. EDWARDS, DIRECTOR OF THE DEPARTMENT OF COAL ECONOMICS, NATIONAL COAL ASSOCIATION (SOUTHERN BUILDING, WASHINGTON, D. C.)

Mr. O'BRIEN. My name is Brice O'Brien, and I am assistant counsel of the National Coal Association, Southern Building, Washington, D. C. I am accompanied by Dr. Ford K. Edwards, director of the association's department of coal economics. The National Coal Association is a trade association representing the producers of a majority of the commercial bituminous coal produced in this country.

As representatives of the bituminous coal industry, we feel that it is appropriate for us to point out a few considerations which we feel should be kept in mind by those charged with the responsibility for administration of the atomic-energy program, because it appears that a number of rather obvious considerations seem to have been lost sight of in the eagerness on the part of many people for this country to embark immediately upon a full-scale nuclear power program regardless of cost.

There seems to be an unjustified clamor that we immediately begin a switchover to nuclear power without regard to considerations of cost and the welfare of our people. We are given the impression that out Nation's survival depends upon this switchover. To state only one example, this committee has been told in this hearing that "we are at the dawn of a great and wonderful era," and that the potentialities of nuclear energy "both for constructive and destructive purposes" constitute issues "involving world survival" which "demand the most intense, dedicated, and coordinated effort of all." I think most of us will agree with that appraisal insofar as it involves the destructive purposes, but I believe the first-glance impression gained from statements of that nature—that our survival depends upon the immediate utilization of nuclear power regardless of cost and other factors—is erroneous.

We recognize that there appear to be many wonderful consequences which may ultimately flow from further discoveries of the secrets of the atom. However, the discovery of those secrets does not require permanent installations to produce high-cost, subsidized electric power. It appears far wiser to concentrate on the research laboratory and on temporary, pilot-scale experimental plants for the obtaining of knowledge which will render nuclear power useful, than to waste huge resources of money, material, and personnel in the construction of permanent, full-scale powerplants for the production of electricity so costly that it cannot be sold without Government subsidy.

Nevertheless, we are under the impression that the Government feels it must immediately embark upon a program which will use huge amounts of taxpayers' money to construct, or to subsidize the con-

struction of, numerous permanent installations which admittedly will not be capable of producing electricity at a price which is competitive with coal. On July 21, 1954, Dr. Lawrence Hafstad (at that time in charge of the Commission's reactor program) indicated that members of the staff of the Atomic Energy Commission recognized that nuclear powerplants are not commercially feasible, and therefore private industry would not build such plants without Government subsidy. According to Dr. Hafstad, the staff members felt that the Government should furnish the difference between the cost of conventional plants and the cost of nuclear plants, in order to induce the construction of such permanent installations. He felt that the Government should continue to subsidize the construction of successive reactors until eventually the cost might be reduced to the cost of conventional plants, at which time the Government should cease such construction subsidies.

It does not appear that the Commission's philosophy has changed very much, if any, from the philosophy expressed by Dr. Hafstad. It is apparently true that present plans do not call for direct use of Government funds for the physical construction of reactors to be owned by private industry. However, there seems little practical difference between direct payment of physical construction costs—as expressed in this hearing, the cost of mortar and brick—and indirect payment of such costs through subsidies in the cost of fuel, purchase of byproducts, and charges for Government services.

Present subsidy plans are not confined to research laboratories and pilot-scale experimental plants—they extend to full-scale permanent plants for the production and commercial sale of electricity which can only be produced and sold through Government subsidy. As you know, one such plant is already under construction for the production of 100,000 kilowatts of electricity. The Commission has asked private industry to state the amount of subsidy needed for more of such permanent, full-scale plants, so the Commission can accept the proposals that involve the smallest subsidy. One large utility has announced that it plans to construct at its own cost a large permanent nuclear powerplant. We believe that such a statement is misleading and that if such a plant is built large amounts of Government funds probably will be required for subsidy purposes if the power produced is to be competitive. As previously stated, we think it is unimportant hairsplitting to argue about whether Government funds are used for brick and mortar in the construction of such plants, or whether they are used instead for indirect subsidies through fuel costs, technical services, and purchase of byproducts.

Information published by the Atomic Energy Commission indicates that if the potentialities of reactors are realized, we may eventually be able to produce nuclear power in the price range between 4 and 7 mills per kilowatt-hour. Those estimates are based, I repeat, upon realizing the potentialities of nuclear reactors—requiring perfection of the breeder process, reduction of capital costs, solution of operational problems, et cetera. In other words, if all goes well the long-range hope of nuclear power is for 4- to 7-mill electricity. It seems poor management to embark upon Government-subsidized construction of permanent full-scale plants with that ultimate goal, when already we can produce 3-mill electricity in the most modern coal plants. It is true, of course, that the cost of electricity from coal is somewhat higher than that in high-freight-rate areas and in steam plants that

were built prior to the development of modern techniques. However, the assumption that nuclear power from presently contemplated reactors may eventually become competitive ignores the fact the rate of efficiency in the utilization of coal has been improved consistently at a significant rate, and that improvement is continuing and can be expected to continue. In other words, the nuclear-power planners are assuming that nuclear power may some day become competitive with coal if nuclear-power technology advances as hoped for and if coal technology stands still.

In 1920 it required an average of 3 pounds of coal to produce 1 kilowatt-hour of electricity. By 1930 the average number of pounds of coal per kilowatt-hour was down to 1.60; by 1940, to 1.34; by 1950, 1.19; and by November 1954, the average was down to 0.97. Some of the modern plants are far below that average. The present utilization efficiency of coal in a steam plant is only about 38 percent, in spite of the continuing progress. It is obvious that there is still a great deal of room for further progress. It is not inconceivable, if research currently underway bears fruit, that when and if nuclear power progresses to the point where it can be producing 7-mill electricity the efficiency of coal utilization will have been doubled over its present rate.

In addition to the utilization-efficiency rate, coal has claims to possibilities of progress in reducing transportation costs. Long-distance conveyor belts and long-distance pipelines for the transportation of coal to market are currently in the construction stage on a limited scale.

The probabilities that the cost of electricity from coal will be further drastically reduced are pointed out here not for the purpose of trying to show that nuclear power can never displace coal, but for the purpose of showing that there is no need for the expenditure of taxpayers' money for the construction or operation of permanent large nuclear powerplants which for the foreseeable future will require Government subsidy to compete with coal.

We concede that atomic energy appears to have unlimited possibilities in many fields, including perhaps the field of industrial power. However, some drastically new method of realizing that energy potential will have to be discovered before the Government will be justified in expending huge sums of money for the construction or operation of commercial plants. In the meantime, we feel the Government's money and personnel could be used to better purpose in research laboratories and small-scale experimental plants.

There are many areas of the world which do not have an abundant source of power, and to which, therefore, the development of nuclear power is very important, but that is not true of the United States. In the past 15 years the economy of England has suffered a great deal because that country no longer has available sufficient supplies of coal. According to recent press reports, England is currently embarking on the construction of reactors the capital cost of which will be $850 million and which will save some 5 to 6 million tons of coal. England may well be justified in such a program, because of the shortage of coal there. But in the United States the abundance of coal is such that more than 7 million tons of coal could be purchased at current mine prices for only the interest (at 4 percent, the AEC rate charge for nuclear fuel loans) on the capital investment in the reac-

tors. Thus, the English program would not be justified in the United States on the basis of interest on investment alone, without regard to the cost of nuclear fuel or the operational costs of reactors.

According to official statistics of the United States Bureau of Mines, as of January 1, 1953, the United States had coal reserves amounting to 1,899,740 million tons. Assuming only a 50 percent rate of recovery, at the current rate of production for all uses (392 million tons in 1954), this is sufficient to last this Nation more than 2,300 years. Even if the most optimistic forecasts of demands for coal bear fruit, the supply of coal will be sufficient to supply this country's needs for many centuries to come.

In contrast to the practically unlimited supplies of coal, it appears we have a very limited supply of nuclear fuel in quantities which permit its utilization. Admiral Strauss has stated in this hearing that if prospecting were to stop today most of our known ore deposits would be exhausted by 1962. Dr. Johnson has told this committee that if we maintain the present rate of discovery of uranium ores we should be able to supply from domestic sources the nuclear power requirements of the United States for a matter of 40 years or more. From his statement it appears that for each 1 million kilowatts of electrical capacity about 600 tons of natural uranium would be required for initial inventory, plus 50 tons for annual replacement.

On the basis of published information it is obvious that we are already relying heavily on imports of uranium—it appears that a few years ago 90 percent of our uranium was imported. It has been stated here that American capital investment in uranium ore mines in Africa alone is in the neighborhood of $120 million. We do not believe this country should seek to subsidize dependence on foreign sources of power, with its attendant danger to the national security.

The national security would appear to be jeopardized, also, by subsidized construction of nuclear powerplants, because of the danger of sabotage. Sabotage of coal-fired steam plants does not represent any particular danger, but sabotage of nuclear powerplants presents an obvious and alarming danger in time of war. As stated by Dr. Libby in this hearing.

> Sabotage of a reactor or its damage or destruction by a weapon could produce hazards despite all safety provisions in the design of the system.

Even without enemy action, the danger of atomic accident should constitute a deterrent to subsidized construction of nuclear powerplants, where no economic justification for such plants exists. This committee has been asked to give consideration to the possibility of having the Government underwrite a portion of the insurance risk against disaster resulting from accidents in the operation of nuclear powerplants. Undoubtedly a high degree of caution will be exercised in the construction of such plants, but as Mr. Mitchell has stated in this hearing:

> inevitably, as more and more reactors are built and used, familiarity will breed some degree of contempt for the dangers. We must expect that at some future time our luck will run out and an accident may set free radioactive contaminants.

Certainly the danger of atomic accident should represent a deterrent to the proponents of "nuclear power regardless of cost."

It seems to us that the matter of trained personnel should mitigate against the immediate construction of subsidized commercial nuclear

powerplants. It seems likely that the construction of such plants will result in hastening the rate at which industry absorbs trained personnel who are now available for true research in the atomic field. This committee has recognized the problems inherent in the loss of specialists in this field. Before the Government subsidizes a project which will increase the loss of such specialists, it would appear advisable to first ascertain that such project is worthy of high priority.

The bituminous coal industry in this country today is suffering severely from a loss of its markets. We point this out ot the committee because we feel that when the Government does subsidize construction or operation of plants for the production and commercial sale of nuclear power, the resulting loss of market to the coal industry constitutes another blow to a depressed industry. For this reason, we ask that any full-scale nuclear powerplants which are Government owned or subsidized in any manner be located outside of coal's normal market areas.

The operation of a 100,000 kilowatt reactor results in the loss of market for about 380,000 tons of coal per year, with attendant loss of employment of miners and transportation employees. The loss of market from one such plant, or even from several such plants, could possibly be taken in stride by a prosperous industry. The coal industry, however, is depressed to the point where even a small loss of market would add to an already heavy burden. I will not go into detail here, because it is common knowledge that the coal industry has lost most of its railroad market and its home-heating market. It has not received its additional share of the utility market because of inroads by competitive fuels.

In the last few years imported residual oil has usurped disastrous portions of its utility markets on the eastern seaboard. Depression and hunger stalks many coal-mining communities. There is official concern lest productive capacity of the industry atrophy to a point where the industry will be unable to supply the country's war needs in the event war cuts off foreign supplies of other fuels.

A Cabinet committee appointed by the President has been asked by the industry to take steps to remove discriminatory policies of the Federal Government which mitigate against the coal industry to the benefit of its competitors. I would like to interject here that the report of that Committee became available Saturday morning, and in the report the Cabinet committee takes official cognizance of the fact that the coal industry is in a depressed situation, as outlined be me in this statement.

Representative VAN ZANDT. Mr. O'Brien, you can add that they have recognized the fact that unless something is done for the coal industry, in the event of an emergency they will not have the production that they need.

Mr. O'BRIEN. That is correct, sir.

In the face of this state of affairs, we feel that if the Commission insists upon subsidizing the construction or operation of full-scale permanent nuclear powerplants then as an absolute minimum it should add to the announced criteria which will be used in evaluating proposals for such subsidized operation, a requirement that the facility will be constructed in an area which is outside of coal's normal market areas.

Before leaving this point, it appears appropriate to point out again that the projected increase in demands for electricity do not necessarily mean that the demands for coal will increase proportionately, as has been assumed in the published reports of the Atomic Energy Commission. The Commission apparently feels that the subsidized construction or operation of nuclear plants will not damage the coal industry because the increased demands for electricity will result in correspondingly increased demands for coal. The increase in the efficiency of coal utilization, previously discussed, has reduced and is continuing to reduce the amount of increased market available to coal from this source. There have been instances in recent years where new power installations have greatly increased the power output of a given company but have actually decreased the total coal consumption through replacement of facilities with a lower utilization efficiency. In the past 10 years, bituminous coal's share of the total energy market has decreased from 50 percent to 30 percent, and the trend has not been halted or reversed.

At page 136 of part I of the record of these hearings, the question is raised as to whether any other mineral besides coal has received a guaranteed Government price. It is obvious from the context that this was a slip of the tongue, and that gold was meant rather than coal. I mention this point merely to emphasize that the production of coal is not subsidized in any manner by Government funds.

On December 10, 1954, the board of directors of the National Coal Association adopted the following resolution on atomic energy:

Whereas the Atomic Energy Act of 1954 not only authorizes the use of Government funds to finance the continued research and development of nuclear power, but also permits Government funds to be used to subsidize the capital cost and the operation of installations for the commercial production and sale of nuclear power; and

Whereas the bituminous-coal industry, which has sufficient coal reserves to supply the Nation's power needs for centuries to come, is economically distressed, with many thousands of men unemployed, and the Federal Government has been asked to give consideration to the depressed condition of the industry with special attention to the danger to the national defense which is inherent therein; and

Whereas the bituminous-coal industry recognizes that it must meet unsubsidized and fair competition whenever the course of progress brings such competition into being, but the industry believes that the orderly and timely development of nuclear power does not require that the principles of private enterprise be violated: Now, therefore, be it

Resolved by the directors of the National Coal Association, That the Members of Congress and the executive branch of the Federal Government be, and they hereby are, urged to take all steps necessary to insure that public funds will not be used for the establishment of a network of Government-owned or Government-subsidized plants for the commercial production and sale of nuclear power: Be it further

Resolved, That the Members of Congress and the executive branch of the Federal Government be, and they hereby are, urged to take all steps necessary to insure that, until nuclear powerplants are able to compete, without subsidy in any form, with conventional powerplants, no plants for the commercial production and sale of nuclear power which are subsidized in any manner (by contribution to capital cost, by subsidy of the cost of fuel, or by subsidy in the purchase of nuclear byproducts) be located in any of coal's normal market areas: And be it further

Resolved, That the officers of the National Coal Association are hereby authorized and directed to take whatever steps may be appropriate to effectuate the foregoing policy.

The resolution just quoted deals with the nuclear power program in two separate and distinct phases. As we interpret the Atomic Energy Act of 1954, it separates the industrial power program into that phase which exists prior to such time as the Atomic Energy Commission declares nuclear power to be of "practical value for industrial or commercial purposes," and the second phase which exists after such finding by the Commission.

In the first stage, the research stage, the act appears to grant blank-check authority to the Commission to spend the Government's money in any way the Commission sees fit, including subsidies for the acquisition by private industry of practical experience in the operation of nuclear power facilities. In the second stage, the competitive stage, section 169 of the act appears to warrant that Government money shall not be used for the construction or operation of nuclear power facilities, but even in this stage it appears quite possible for Government funds to subsidize the operation of such facilities through unrealistic prices charged for fuel and paid for nuclear by-products, through unrealistic charges made for Government services in connection with such operation, and through research contracts under section 31.

I have read with interest the discussion that has taken place in this hearing with respect to the congressional intent expressed in section 169. We hope the intent revealed by the minutes of the executive sessions of this committee is fully effectuated, insofar as the competitive stage of nuclear power is concerned. I would like to emphasize here that the coal industry is not asking that Congress place any obstacles in the way of unsubsidized competition from nuclear power, but the industry does feel it is entitled to ask that taxpayers' money not be used to subsidize its competition. I would also like to point out accurate and realistic bookkeeping will be required to determine whether subsidies are being granted with respect to fuel, byproducts, charges for Government services, and research contracts. That bookkeeping is necessarily secret, and we ask therefore that the executive personnel in charge be kept aware at all times of the congressional intent in this respect.

It is our position that in the research stage of nuclear power no plants for the commercial production and sale of nuclear power which are subsidized in any manner should be located in any of coal's normal market areas. We feel that research and experimental plants built in whole or in part with Government funds should, if they are designed for the production and commercial sale of power, be located in areas where they will not further diminish the markets for coal, but instead should be built in areas where such power will displace fuels which have a relatively limited life.

Before concluding my presentation, I would like to discuss briefly the question of Government charges for nuclear fuel and guaranteed prices for nuclear byproducts. I hope you will appreciate that our views are necessarily based on the limited understanding which is possible for the layman to have in this field—we do not have access to the schedule of prices to be charged, and of course we do not have access to the data dealing with the cost of the Government of the nuclear fuel which will be made available to nuclear powerplants.

We do not expect, nor ask, access to such information, but we do ask that the personnel in charge of this phase of the program keep in mind at all times that charges for nuclear fuel should be set at a price which will return to the Government the full cost of obtaining and processing such fuel.

After reading part I of the record of these hearings, I am very confused on the principles used in setting the guaranteed price which will be paid by the Government for nuclear byproducts. At one point Mr. Nichols stated the price for U–235 was based on the anticipated cost of production, and plutonium for fuel was based on the relative worth of plutonium in a power reactor compared to U–235. At another point, Mr. Nichols stated the buy-back prices were set at a reasonable rate which would primarily encourage the development of power reactors, rather than primarily encourage the development of materials for weapons. At still another point it is stated the Commission has set a "slight increase" over the fuel price because some of this material can be used for weapons.

We feel these conflicting considerations emphasize the necessity for a full understanding on the part of the administrators of the atomic-energy program that Congress does not intend for taxpayers' money to be used to subsidize the production and commercial sale of nuclear power. It appears inappropriate for anyone without more information and understanding of the nuclear power program than is available to me, to try to discuss proper levels of Government charges for nuclear fuels and guaranteed prices for buy-backs. However, it does appear to us, on the basis of our limited understanding of the problem and its background, that certain principles would, if properly followed by those in charge of this matter, effectuate the Government's "no subsidy" rule. First, as previously stated, we believe charges for nuclear fuel should be set at a level which will return in full the Government's complete cost of obtaining and processing such fuel. Second, such portion of the byproducts as is suitable for weapons use should be paid for at prices no greater than it would cost the Government to produce such material without utilization of the nuclear power facility, and should be purchased at such prices only so long as the Government wants and uses such materials for further increasing its weapons stockpile.

Third, other nuclear byproducts should be purchased by the Government at prices which will not involve a loss to the Government—in other words, at prices no greater than the prices which the Government can obtain for such byproducts from prospective users thereof. I realize that at the present time the buy-back price of byproducts suitable only for powerplants would be zero, or nearly zero, because there is no present demand for such byproducts. However, it appears that unless this price principle is ultimately adopted the Government will be continuing to subsidize the operation of nuclear power facilities.

I wish to thank the chairman and the other members of this committee for the opportunity to present the views of the bituminous coal industry.

Chairman ANDERSON. I want to thank you, Mr. O'Brien, for a very good paper. It is a very interesting paper, and very much worthwhile to us, I am sure.

Of course, I do think that if you are going to figure on a 2,300 year supply of coal it has to be done on two assumptions: (1) that there is not going to be any increase of population, and (2) there is not going to be a gradual incerase in electrical energy on a per capita basis, and both of those assumptions are probably not tenable.

Mr. O'BRIEN. That is correct, sir. I think the statement indicated that the 2,300 years was based upon present rate of consumption only.

Chairman ANDERSON. That is what I say.

Now, Great Britain has been pushing atomic power in order to permit the conservation of coal in order that coal can be used by the chemical industry.

Do you not feel that that is a possible additional market for the coal industry of this country?

Mr. O'BRIEN. I think perhaps Dr. Edwards could discuss that better than myself. But it is my understanding that the chemical use of coal is a very limited market tonnagewise. I would ask Dr. Edwards to add to that.

Dr. EDWARDS. That is true. That would account for a very small part of our problem.

Chairman ANDERSON. I did not think it was significant. I did believe it was a possibility. I think this is a very fine presentation and we are indebted to you for it, because these are factors we must keep under consideration.

Representative DURHAM. Mr. O'Brien, your fear seems to be of subsidizing this fuel element from the Government standpoint. Why is there such a fear?

Mr. O'BRIEN. We are assuming, sir, that the prices for fuel and the buy-back prices must reflect a subsidy. The reason for our assumption is that there have been statements that companies are ready to go ahead in the construction of these plants with their own capital. From what we have read we see that everyone is agreed that these plants are not competitive, and we know that private industry is not in the habit of building noncompetitive plants.

Representative DURHAM. I think you people can feel pretty well satisfied that this committee, which is a watchdog committee, is not going to permit, if they can help it, a hidden subsidy being placed in this thing to the benefit of some and detriment of other fuel elements.

We want it to stand on its own feet, just like coal. I notice here you say at the present time you are not taking out but about 38 percent of the British thermal units from the coal, which gives you still a long way to go of reducing your costs in the fuel element.

Mr. O'BRIEN. That is correct, sir.

Representative DURHAM. I just want to assure you that I do not think we are going to permit that to happen.

Mr. O'BRIEN. I am very grateful for that reassurance, sir, and I had gained that impression from reading volume 1 of the report of this hearing. I was very much reassured by the attitude of the members of this committee as expressed in the discussion of subsidies.

Representative DURHAM. I think everybody in Congress is concerned about it. I realize at the present time it is a pretty sick industry, the coal industry, which you admit in your statement.

Mr. O'BRIEN. It is, sir.

Representative DURHAM. You have quite a problem there, and it is too essential to the committee to close its eyes and do like we have done on manganese and some of these other critical items.

Thank you very much.

Representative VAN ZANDT. Mr. O'Brien, is it not true that the National Coal Association, speaking for the coal industry as you do, is not taking a position against Government-sponsored experimental atomic generating plants?

Mr. O'BRIEN. That is correct, sir. We are not trying to stop the Government from doing research and experimental pilot-plant work, and things of that nature. We do not want the Government to construct full-scale plants for the sale of electricity in our areas. We are not trying to stop the construction of experimental plants which are on an experimental scale.

Representative VAN ZANDT. I think the gentleman from North Carolina just mentioned a moment ago that this committee is a watchdog committee and we are very definitely in opposition to the Government getting into business in the field of atomic energy and the generation of electricity.

Now, Dr. Edwards, I think it was Dr. Hafstad who told the committee that in the year 2000, 76 percent of all of the energy produced at that time would be produced by liquids from coal.

Would you agree with that statement? He said that 76 percent of all of the energy to be produced in the year 2000 would be produced through the utilization of liquids extracted from coal.

Dr. EDWARDS. Well, I have never had occasion to run that down. I do not know how to view that statement. As yet, we have not found that extraction of energy in the liquid form from coal is economical, that is in competition with present supplies of oil and gas. That is apparently a ways off.

Representative VAN ZANDT. I was of the opinion that the by-products of coal, when disposed of by the producer, would leave him with this cheap liquid on his hands that could be used for heating purposes. That would eventually take the place of the utilization of raw coal.

Dr. EDWARDS. That may be. I am not in a position to judge the rapidity with which that development has come. It has not come about to any degree yet.

Representative VAN ZANDT. Now, I think probably Mr. O'Brien can answer this question.

In the National Coal Association do you have any complaints about Government purchase of coal for, we will say, the Atomic Energy Commission plants, or even the TVA?

Mr. O'BRIEN. We have to this extent, sir, that we believe that in certain areas the Government is not purchasing the most economical fuel that it could purchase, taking into consideration the considerations of conservation. For example, the Atomic Energy Commission in one plant in Tennessee is using rather large quantities of natural gas, and it has tied itself up to the use of that natural gas for quite a long period of years.

I believe the cancellation clause would cost them something like—it is a large number of millions to get out of the contract—so that they cannot reasonably switch over to coal at the present time.

We feel that they should not have tied themselves up to the consumption of natural gas which is a scarce and valuable commodity. There is plenty of coal in the area that could be used instead.

Representative VAN ZANDT. If my memory serves me correctly I think the Oak Ridge plant converted from coal to gas.

Mr. O'BRIEN. That is the plant I had in mind.

Representative VAN ZANDT. Is it not true that they maintain a stockpile of coal in the event that they lose the gas pressure?

Mr. O'BRIEN. They do maintain a stockpile of coal; yes.

Representative VAN ZANDT. It is your thinking that because of the availability of cheap coal that they should use coal instead of natural gas, which they pipe in from the Southwest?

Mr. O'BRIEN. We feel that is correct, sir. Their figures showed a slight saving through the use of gas over coal. We feel that buying it on that basis, in such large quantities, fails to take into consideration the considerations of conservation, and also we are faced with the fact that now that coal has cut its costs of production in some areas the plant is up against a situation where it cannot compete for that market because it is under a long-term contract.

Representative VAN ZANDT. I have one more question, Mr. Chairman.

Is it not true that the AEC is buying annually somewhere near 30 million tons of coal for their installations, we will say, at Richland Wash., Oak Ridge, and Savannah River?

Mr. O'BRIEN. I am not in a position to be very definite on the amount. I know that your assumption is substantially correct. The amount may vary very slightly, and I am not sure of that.

Representative VAN ZANDT. It was a sizable chunk of coal, and I have been watching it grow because of my interest in the coal industry.

Mr. O'BRIEN. It is very sizable, and I assume your figures are about right.

Senator GORE. I have one question.

Mr. O'BRIEN. I did not have the privilege of hearing your testimony, but I have read it and I know it is a very very useful statement having a lot of useful facts. One thing did raise a question about which I wished to inquire.

At the bottom of page 3, you cite that the Atomic Energy Commission estimates that eventually we can produce 4 to 7 million electricity, but that today there are some coal plants producing 3 million power.

Mr. O'BRIEN. Yes, sir.

Senator GORE. Where is that 3 million power production?

Mr. O'BRIEN. Let me put it this way, if you will: I took the figure out of the official publication of the Atomic Energy Commission, which stated that the more modern plants are producing 3 million power. The only plant I can name offhand to you, perhaps Dr. Edwards can assist me on this, but I have been informed very recently that the Ohio Valley Electric Corp. produces electricity and carriers it over transmission lines for a distance of up to 125 miles for 3½ mills. That 3½ mills includes the transportation over that number of miles. I cannot name specific plants, otherwise, but I would like to ask Dr. Edwards if he has any information on that.

Senator GORE. The point of my question is to bring into consideration the high cost areas. New England is one.

Mr. O'BRIEN. Undoubtedly, sir, the 3-mill area is in an area which does not have long freight costs.

Senator GORE. It must be in an area which combines at least three things, one, a new plant and new and efficient plant with good management, and two, availability of coal in the area, and three, a very good type of coal. You might not have those three circumstances in a large plant of the country. I think that the high cost power areas are the source of a great deal of the push for development of atomic power.

Mr. O'BRIEN. I think undoubtedly you are correct, sir. I do not know that it is material, but one of the things I would like Dr. Edwards to comment on, and I believe that you said "Availability of a high type of coal."

From my knowledge of this, I was under the impression that the type of coal used for steam production was not a very high quality coal, and I would like to ask Dr. Edwards that.

Dr. EDWARDS. That is usually the cheaper coal, the fines, and it may vary. If the freight rate is high, they may use 13,000 B. t. u. coal, but they very commonly get down to 10,000 B. t. u. coal.

Senator GORE. I had understood that there were veins of coal that did not lend themselves as well to steam plant use as other veins of coal.

Dr. EDWARDS. I believe that used to be true, but it is no longer true. With the new burning processes, where fine powdered coal, the consistency as fine as talcom powder is blown and practically exploded, they can burn practically anything.

Senator GORE. So your principal limiting factor would be distance from the coalfields?

Dr. EDWARDS. That is right.

Senator GORE. The freight rates?

Dr. EDWARDS. Yes; and freight rates. And, of course, you have coalfields extending from the east coast to the Mississippi River and then from there into Kansas. A new powerplant, one of the largest, has been built practically on top of a coal mine, 70 or 80 miles from Kansas City.

Senator GORE. I will not persist in this. I know it is getting late, but is New England the principal high-cost area so far as availability of coal is concerned in the country?

Dr. EDWARDS. I would say inland New England. Along the coast they have the benefit of charges of water transportation and charges that do not vary greatly from New York and Philadelphia.

Senator GORE. Thank you very much.

Representative VAN ZANDT. And may I add that much of that market has been lost by the importation of residual oil from Venezuela.

Dr. EDWARDS. There have been tremendous losses, and we have lost practically half of the competitive heavy fuel market on the east coast to residual fuel oil and to crude oil refined on the east coast.

Representative VAN ZANDT. We folks in central Pennsylvania know it. We have lost 85 percent of our coal market, with the result that 18.6 percent of mine employables in central Pennsylvania are unemployed today.

Dr. EDWARDS. You mentioned 30 million tons of coal being purchased by the Atomic Energy Commission. We do not have the

figures and we have endeavored to get them, but I think that that is substantially too high. That is a tremendous amount of tonnage. We lost last year, our consumption dropped about 60 million tons, and if we picked up anything approaching that we would have found it in our figures.

Senator GORE. I am glad to say that TVA is now the largest purchaser of coal I believe in the world.

Dr. EDWARDS. They are an extraordinarily large purchaser.

Chairman ANDERSON. Thank you very much.

(Thereupon at 4:35 p. m., Monday, February 28, 1955, the Joint Committee adjourned until Tuesday, March 1, 1955, at 2 p. m.)

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DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

TUESDAY, MARCH 1, 1955

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The Joint Committee met at 2:05 p. m., pursuant to recess, in room P–63, the Capitol, Representative Carl T. Durham (vice chairman of the Joint Committee) presiding.

Present: Representative Durham (vice chairman); Senators Pastore, Gore, Hickenlooper, and Knowland; Representatives Price, and Cole.

Present also: Corbin C. Allardice, executive director, George Norris, Jr., counsel to the Joint Committee, and Walter A. Hamilton of the professional staff of the Joint Committee.

Representative DURHAM. The committee will come to order.

The meeting today is a continuation of the hearings which we reopened yesterday, and the first witness, I believe, today, is Adm. Earle W. Mills, president of the Foster Wheeler Corp.

Admiral, will you come around?

Admiral, we are glad to have you with us today. You may proceed.

STATEMENT OF EARLE W. MILLS, VICE ADMIRAL, UNITED STATES NAVY (RETIRED), PRESIDENT, FOSTER WHEELER CORP., APPEARING IN BEHALF OF THE FOSTER WHEELER-PIONEER SERVICE-DIAMOND ALKALI NUCLEAR POWER PROJECT

Mr. MILLS. My name is Earle W. Mills. I am president of the Foster Wheeler Corp. I am here today with Mr. F. C. Kellogg, president of Pioneer Service & Engineering Co. I wish to advise you, Mr. Chairman, that Mr. J. A. Sargent, president of Diamond Alkali Co., who intended to be present, was grounded at the airport in New York this morning and was not able to get down. So he asked me to express his regrets that he could not be here. I am appearing as spokesman for the Foster Wheeler-Pioneer Service-Diamond Alkali nuclear power project.

It is a pleasure to respond to your invitation to present our comments and observations on the policies, programs, and actions of both the Commission and industry in the field of atomic energy.

Representative COLE. May I interrupt just a moment to inquire if there is any significance in your appearance today along with Mr. Kellogg and Mr. Sargent?

Mr. MILLS. No, sir.

Representative COLE. Are your three companies working together in some fashion?

Mr. MILLS. Yes, sir, a joint study group.

Representative COLE. Does your statement explain that?

Mr. MILLS. Yes, sir. That is what we call the Foster Wheeler-Pioneer Service-Diamond Alkali nuclear power project, Mr. Cole.

Representative COLE. I see.

Mr. MILLS. We have chosen to submit a joint statement since we feel that it is important for us to acquaint the new members of the committee with our collective status and to indicate our most recent opinions on the status of the act. Beside the activities of our individual companies in their fields as associated with atomic energy developments, we have had a joint project group active for approximately 2½ years. It has been the responsibility of this joint group under study agreement with the AEC to investigate the broad aspects of nuclear power especially in the field of electrical production. We will discuss some of the observations developed by our group in its economic survey of reactor systems for central station power production (a report of which was submitted to the Commission in October 1953) and the present design study phase.

As a result of the Commission's announced price policy, we have reexamined the cost estimates prepared for several types of power-producing reactors. We believe that the new price policy is a step in the right direction since it has allowed us to use concrete and official fuel prices in examining the economics of nuclear powerplants. These prices have caused us to revise our estimated cost of nuclear power downward below those obtained a year ago using unofficial prices and assuming purchase rather than lease of fuel. This already has served to stimulate more interest on the part of private finance in future nuclear powerplants.

Representative COLE. May I interrupt? I noticed that you departed from your prepared statement, omitting——

Mr. MILLS. I decided to do that, sir, because there are some classified features in this, and I did not want to establish any questions of relativity with respect to it by a percentage.

Representative COLE. So we and the reporter can understand that your omission was deliberate and should not appear in the record?

Mr. MILLS. Yes, sir.

The Commission has priced the returnable special nuclear materials, which might be produced in a reactor, at a lower rate than anticipated. A higher rate would have further encouraged the materials produced (dual-purpose) type of reactor for immediate construction. Nevertheless, it is our opinion that reactor development should be directed toward the day when the market price of nuclear materials may correspond to their fuel values. A major concern still remaining, however, is the 7-year time limit for the price schedule.

Since the prices, especially those for special nuclear materials, apparently have been established without direct relation to the costs of production today, it appears to us that some consideration should be given to extending the time limit or assurances given that wide variations will not occur when a new price schedule is released in 1962. You can appreciate this concern if you consider that the economic justification of a plant based upon these prices could be altered mid-term during the life of the plant if the revised schedule should change

materially from the original schedule. The risks of these revisions would further complicate the demands for depreciation adjustments. Another aspect which must be given further consideration and clarification is the regulation of the amount of fuel available to industry to cover the reserves necessary for continuous operation while part of the fuel is being held up for processing or reenrichment. Policy statements in this regard will influence the type of reactor plant which will be developed and used.

While the apparent improvement to date in the economies results from the Commission's new price policy, there are still several practical problems which remain unsolved and untested. We feel that the most vital ones are those concerned with metallurgy and fabrication, operation, especially fuel processing, and insurance financing.

It is becoming evident that the test facilities which allow the testing of materials and components under irradiation are inadequate to efficiently provide conclusive evidence for the design of power reactors.

One aspect of the Commission's 5-year program is concerned with the behavior of materials and components under irradiations which will be experienced in power reactors. The 5-year reactor program may be regarded from this point of view as providing highly specialized test facilities. We feel that this is more important in the long run than the actual generation of electrical power on a small scale, about which there is so much publicity. We are heartily in agreement with a program that will yield basic technical information and feel that the Commission should be encouraged to operate these test facilities with as much flexibility and for as long a period of time as convenient to obtain as much fundamental data as possible. In our opinion this data will serve as the starting point for the design of competitive nuclear powerplants on a basis that is technically and economically sound.

The results from the operation of the test facilities should then receive the widest possible dissemination to public and private interests so that they can be used effectively. In order to insure this wide dissemination of the fundamental data it seems highly desirable and important that Government and industry cooperate fully during this 5-year period. As this fundamental data is obtained and made available to everyone interested we are certain that industry, which has already contributed much to the development of nuclear power from its experience in related fields, will make use of the results in forging ahead at an accelerated rate in the design, construction, and operation of efficient nuclear powerplants.

As the results from the test facilities become available two other important problems will become more evident. These are concerned with reprocessing the radioactive partially spent fuel and of arranging with underwriters to assume the risks of insuring nuclear power installations.

As of now, it appears to us that the reprocessing of spent fuel will be costly if individual reprocessing plants of small size are built near each powerplant.

This results from the fact that although the equipment may be small the necessity to safeguard against the spread of radiation from the process, and the safe disposal of the wastes add a large capital investment which does not change appreciably with size. Hence it seems logical to achieve economy by building larger capacity reproces-

sing plants which can be located conveniently for disposal and can handle the fuel from several powerplants. Since the shipment of radioactive spent fuel will be a unique problem, it is appropriate at this time to give consideration to regulations affecting transportation of spent fuels. The outcome of regulation in this area will also influence the reactor designer.

It has been our experience in examining the means for reprocessing that the variations in reactor design have also been carried over into the fuel-reprocessing area so that reprocessing plant design is unduly complicated. Central coordination of the research and development in this area is essential if the best use of the now widespread and loosely coordinated data is to be used effectively and economically. We feel that the Joint Committee could be of assistance in clarifying the existing declassification sections of the Atomic Energy Act and continuing to encourage the Commission to release more of the classified technology.

That also, gentlemen, carries with it a complete understanding that if national security is involved, naturally we would not expect any information that is classified and affecting national security to be released. But short of that, we think there ought to be quite a liberal policy.

It is clear that the disposal of radioactive waste products will become of great importance when nuclear powerplants compete economically with those using fossil fuels. We feel that incentives in this area need to be increased in order to assure the economic culmination of nuclear power.

I might add in there, sir, when I use the word "incentives" I simply mean stimulus, not a subsidy. I am merely talking about encouragement and a stimulus to do something about this problem.

In order to insure an adequate examination of this problem it would seem reasonable that the Commission should consider providing suitable samples as irradiation sources from the present radioactive wastes at essentially no cost to any company or agency equipped to handle radioactive material and interested in doing research which might lead to finding methods for the profitable utilization or disposal of these wastes.

The last problem which we wish to discuss in this statement is the difficulty of interesting underwriters in assuming the risks of insuring nuclear installations.

This problem has several important aspects. One is the need for uniform construction codes and material specifications to be formulated by an authoritative body—and I have used this simply for the purpose of explanation—as, for example, the boiler and pressure vessel committee of the American Society of Mechanical Engineers. The work of this body, in the past, is a fine example of industry cooperating in drawing up generally recognized rules for the safe construction of boilers and pressure vessels. These rules are accepted by enforcement agencies of most States and municipalities as a basis for authorizing the installation of boilers and pressure vessels within their jurisdictions. Compliance with these rules is also used by insurance companies as the basis for writing policies on such equipment.

Up to now, no comparable rules for the safe construction of components of nuclear plants subject to pressure, temperature, and radioactivity, establishing minimum safe material, construction, inspec-

tion, and quality control standards acceptable to all enforcement agencies and insurance companies, have been formulated. Consequently, the enforcement agency of each State or municipality undertakes or may undertake to make its own rules. This would tend to create a state of confusion which could seriously retard development and manufacturing progress.

I would like to say here that when I mentioned this code committee of the ASME I was simply using that as an example. But we have in another field something that is quite similar in our exercise of control through the Federal Communications Commission of our channels and our facilities for radio and television communications. If we did not have some overall basic rules of that kind, we would have utmost confusion in that field. Although I mentioned this code of the American Society of Mechanical Engineers, it was purely my purpose in mentioning that to point out the fact that I feel that some sort of an authority, governmental in its organization and inception, conceivably a part of the Atomic Energy Commission itself, must be set up, and they must be armed with some sort of authority whereby their findings will be accepted across State borders and in the various local governments.

In view of the fact that a serious calamity in a nuclear-energy installation in one community might conceivably destroy lives and property beyond the community, or beyond State borders, it is quite important that appropriate construction codes be developed by a respected authority, and that the codes be accepted on a national basis. It is believed that this can best be accomplished only by an act of Congress.

Another serious aspect of the insurance question that deserves the serious consideration of the committee is the problem of satisfying claims that might arise from a catastrophe in a nuclear-energy installation resulting in the destruction of life and property or the impairment of the habitability and utility of property not otherwise damaged by the catastrophe. The aggregate amount of such claims could easily exceed the resources of any private insurance underwriter, or even of groups of underwriters. These possibilities suggest that, for some time to come, Government must provide the enforcement and inspection agencies and insurance underwriters with a legal umbrella, relieving them, in part, of the incalculable risks until experience results in reductions of the risks to reasonable commercial dimensions. In other words, no private insurance coverage would be expected to exceed a predetermined amount; the remaining coverage to be assumed by Government participation similar to general catastrophe coverage, as developed in wartime emergencies, both here and abroad.

We are cognizant of the complex problems associated with the declassification of reactor technology and appropriate the Commission's effort in defining the so-called gray zone of operation. We feel that the dissemination of information obtained under the auspices of the AEC will be of great value to industry and the national economy both directly and indirectly. We would encourage the agencies concerned to continue to liberalize the rules governing the interchange of this information among interested parties.

In conclusion, it is appropriate to state that in our joint project, we are now applying and extending the available information on the

various promising types of reactors to work up designs of full-sized powerplants. We feel that it is important to clearly define the problems of design and operation in our search for economical answers. At present we are active in a design study of the aqueous homogeneous type of powerplant. Our effort has included close liaison with the national laboratories, especially the one at Oak Ridge. This liaison has included placing a man at the laboratory at our expense to augment the staff working on research and development with the experience of the powerplant industry. Many other companies have followed a similar approach. In many cases our engineering and design experience has been made available at no cost to the Commission so that test facilities could be reliably designed and constructed. Diamond Alkali, at their own expense, has established a radiation laboratory to study the possible applications of using radioactive materials in the chemical industry. We have thus by close association with the Commission acquired information from them and imparted information to them. Such cooperation between the Commission and industry will lead us to the desired goal.

Upon the conclusion of that statement, Mr. Chairman, I would like to add a few remarks along this line:

I have felt, as an individual who has been associated with the stimulation of the development of power from nuclear energy since the early days of the Manhattan District, that it has been necessary, if you wish to use this expression, to glamorize the production of nuclear power from atomic sources. I think we have now reached the time, however, where we ought to give publicity to many of the real problems that are involved in this matter and not spend so much time in leaving the impression that all we have got to do is get a reactor with nuclear fuel and that our sources of heat are answered for some time to come.

Of course, all of you gentlemen know that that is not true, that we have many problems involved in the reprocessing, the handling of these partially spent fuels, which we have to do to prevent waste, and that that reprocessing in itself, as pointed out in my statement, creates a problem of disposing of radioactive waste material.

Those problems are the problems that require, I think, more publicity in order that our citizenry as a whole realize that we cannot make progress at too fast a rate. We can only make progress at a rate at which we can digest both the advantages and the disadvantages and learn how to handle the disadvantages.

Senator PASTORE. I wonder if the changing of the law, Admiral, has very much to do with expediting that today.

Mr. MILLS. Yes, sir. I appreciate that, Mr. Pastore.

The only other point I wish to make is that in any production of electric power for general use from nuclear sources there is brought to the fore that problem that faces a utility company at all times, and that is that it must be ready to serve constantly, it must be ready to maintain power on its lines continuously, and that brings up a great problem as to knowing what to expect—which the law provides for in carrying out this full-scale test program—which I think has been excellently conceived both by this committee and by the Atomic Energy Commission in providing the facilities where materials can be studied. But we have a long way to go, gentlemen. I think that up to now,

considering the problems that we have had to encounter, that we have made remarkable progress. I am only holding out a word of caution that we should not try to run before we have learned to walk.

Representative DURHAM. Admiral Mills, you certainly have given us an excellent statement and one that is full of good thoughts and ideas. I recall very well in 1946, when we first began to struggle with this problem, a speech that you made, which I am sure you will recall, advocating the nuclear-powered submarine reactor.

Mr. MILLS. Yes, sir.

Representative DURHAM. And I want to congratulate you on the help and also the completeness of that job. Since you have raised the question here that we have to walk before we really run, I think you have already run a good long ways your own self.

I have 1 or 2 questions I would like to raise here. One of them is your concern about the 7-year limit on the price schedule. You did not state the reason why you feel the 7 years is detrimental in getting at this job of reactors.

Mr. MILLS. The only point that I was trying to make there, Mr. Chairman, is that I realize there are going to be changes, but those changes must be gradual changes and not sharp changes at the end of any given period. That is the only point I was trying to cover, sir.

Representative DURHAM. I got a different viewpoint from the statement, that you felt like it would be chopped off and changed.

Mr. MILLS. I cannot conceive that would be done, Mr. Durham.

Representative DURHAM. I cannot either, and that is the reason I raised the question.

Mr. MILLS. Yes, sir.

Representative DURHAM. And the other question is the matter of reprocessing. It never occurred to me that this reprocessing would get out into the hands of individual operators quickly, because, after all, it is one of our most difficult problems we face in the whole thing. Do you not feel like, since we have had a good deal of experience and so far have had a very satisfactory safety record, that it probably should be the Government's job of reprocessing instead of getting industry into the reprocessing plants? I am just asking that question.

Mr. MILLS. I think I would agree with that, Mr. Durham. Again, the point that I was trying to make was the fact there should be a considerable discussion between the Government agencies and industry in trying to pick out the sites and locations for these reprocessing plants in order that it may serve without trying to encourage industry to set up a processing plant for each one.

Representative DURHAM. I raise this primarily because, since we hold title to the critical material at all times, it seems like a good business judgment to me for us to do the reprocessing and relieve industry of that. I do not know what the charge should be, but probably there should be a charge.

Mr. MILLS. There is a point there, Mr. Durham, that I think is well worth consideration, and that is the fact that if you ultimately have even 10 percent within a reasonable period of years of power in this country being developed by nuclear sources, this problem of waste disposal is going to become a serious problem. I think everybody recognizes that, particularly the committee and the Commission. But my point is that perhaps, particularly in the chemical field, industry could aid the Government agency in developing some better means,

even though the Government continues to control it, and I would encourage, as I proposed in this brief statement of mine, that certain of these waste materials be made available without charge to industry to those companies who are capable of carrying out that kind of research, particularly those in the chemical field, that we may develop some use or some better method of disposal than we envisage at the present time. That is really as far as I was trying to go.

Representative DURHAM. I have another question. On page 3 of your statement you say:

> Up to now, no comparable rules for the safe construction of components of nuclear plants subject to pressure, temperature, and radioactivity, establishing minimum safe material, construction, inspection, and quality control standards have been formulated.

Do you not feel that at the present time the Atomic Energy Commission can set up such rules under present legislation?

Mr. MILLS. I think that is where it has got to be started, but I believe that, again, continuation of that effort which is already underway might be added to by the bringing in of additional members from industry who have been engaged in this very codification and code work.

Representative DURHAM. It looks like that would have to be one of the first things done.

Mr. MILLS. Yes, sir, very definitely. I feel that is not as far along in its progress, due to the necessity of testing out at great length the action and life of materials under irradiating conditions so that we know what sound standards are.

That is really the basic reason behind my statement about learning to walk before we run—that I do not want to see the mistake made of pushing this thing too fast until we have had a chance to test out these materials and know what safe standards are.

Representative DURHAM. The only reason I raise the question, the committee has provided a law, of course, which says that the Commission can provide these rules and regulations at the present time.

Mr. MILLS. That is correct. I did not mean to leave any impression it was not provided for. I was simply trying to broaden industry's participation.

Mr. Chairman, there is one other point. I do not feel that I am an expert on the subject of either insurance or patents, but I made a few notes, and my understanding from my reading over the record was that the question of patents was discussed pretty thoroughly at your meetings from the 7th to the 11th of February. But if it is of any interest to you, I have a paragraph here of about a half a page that I thought I would like to put into the record, elaborating to a slight extent on my comments both with respect to insurance and the patent situation.

Representative DURHAM. Without objection, it will go into the record.

Senator Pastore, have you any questions?

Senator PASTORE. Admiral, so that we can better reach the minds of the lay people in this field of production of atomic energy for electric power, as you sit before us today, are you more optimistic or less optimistic than you were a few years ago? You have been in this field for a long time.

Mr. MILLS. I am more optimistic, Mr. Pastore, but I am reaching the point where I feel that there is not a sufficient understanding among the lay citizens, to use your expression, that there are a number of very serious problems connected with this development of atomic power that go far beyond the building of a reactor. And I can understand the reason for it, Mr. Pastore.

I felt our problem—that is the way I felt personally and I am sure that is the way the committee felt—was to get this problem started, to get it worked on for the development of power; and to do that, to get the matter off of dead center, if you please, you have got to emphasize the attractive part of it, what looks like an inexhaustible supply of energy, almost in its ultimate development to be self-sustaining as far as producing more active material is concerned. But the other disadvantages during that period of developing the problem have been to some extent, in my opinion, soft-pedaled. I think we ought to look the matter right square in the face and we ought to have more information of that type instead of pointing out the manifold advantages of this thing which we have repeated a number of times, in order to let people understand what we are going to have to do to overcome the problems that go along with this development. That is my point, sir.

Senator PASTORE. Is it your impression that the Commission itself is fully conscious of these problems of which you speak?

Mr. MILLS. Fully conscious.

Representative DURHAM. In other words, they are well known?

Mr. MILLS. Well known, yes, sir. As a matter of fact, in the past I have asked, I believe, the present Chairman and the predecessor Chairman of the Atomic Energy Commission why we had not more publicity on the disadvantageous side of this problem, and I thought their answer was a good one—that they did not want to discourage the development of the problem. But I feel we are beginning to reach the point now where we have to look at both sides.

Senator PASTORE. Let us pinpoint that a little more, Admiral. Do you think that the failure on the part of the public to understand all of these various problems that you pointed out is slowing down the program, or would that necessarily slow down the program possibly to the misunderstanding of some people?

Mr. MILLS. Only from the misunderstanding of some people.

Senator PASTORE. In other words, the fact that the public would understand that these problems were involved would not expedite the program any better than it has been expedited?

Mr. MILLS. No, but I think it would give a more comprehensive report.

Senator PASTORE. Of why it is not coming along as fast as some people think it should come?

Mr. MILLS. That is exactly my point.

Senator PASTORE. In other words, it is not slowing down anything, but it would merely serve to quiet the anxiety on the part of the people that it is not coming faster?

Mr. MILLS. That is my point—that I think the public is expecting us to produce atomic power faster than we can, and for that reason.

Senator PASTORE. I think the record should be clear on that point.

Mr. MILLS. That is exactly my point.

Senator PASTORE. You are not being critical of inertia on the part of the Commission or anyone else connected with the Government in assisting you in bringing this about in quicker fashion?

Mr. MILLS. Not by any means.

Senator PASTORE. Let me ask you: Your association with the Commission is on a steady program?

Mr. MILLS. Yes, sir.

Senator PASTORE. In your opinion, do you think we have reached the day where private industry can undertake this problem on a broad scale exclusively with its own finances or do you feel Government still must be in this?

Mr. MILLS. I think Government has got to be engaged in it for some time to come, sir.

Senator PASTORE. When I say "Government" I mean with money.

Mr. MILLS. Yes, sir; I mean with money, too. I also feel that there is an increasing interest on the part of private finance, as I point out. But again I think that we should not expect that to happen too rapidly. It has got to be a gradual transition.

Senator PASTORE. Would you care to venture a guess at how far away from the day we are when atomic energy can be used competitively with conventional fuels?

Mr. MILLS. Mr. Pastore, any guess I would make on that, in my opinion, is not worth any more than the other guesses you have had.

Senator PASTORE. Would you want to guess?

Mr. MILLS. I think I would go along with 10 to 15 years. That is a guess.

Senator PASTORE. I realize that, naturally.

Mr. MILLS. Mr. Durham, with your approval, I would like to read these two paragraphs that I have made some notes on.

Representative DURHAM. Yes.

Representative COLE. I was going to ask that you read it, but before that I would like to disabuse your impression you had when you said you had understood the committee had examined the question of patents rather thoroughly and exhaustively in earlier hearings the past month. That is contrary to the fact. It has been discussed but it has not been considered by the committee thoroughly, and the discussion was only superficial.

Mr. MILLS. Mr. Cole, I was not as specific in my language as I should have been. What I really meant to say was that I understood there was some discussion of the patent situation, and that as a result of that discussion there was going to be a later hearing to go into the matter more thoroughly, and probably the appointment of a committee, if you please, from industry to work with you.

Representative COLE. I see now that you do have an accurate understanding of the situation.

Mr. MILLS. That is what I had in mind, sir.

Going back to these two paragraphs that I had with respect, first, to the insurance umbrella, it is my opinion that industry should reach definite conclusions as to the amount of insurance that it needs in any given project and together with the insurance groups develop a way of providing the maximum possible insurance capacity from private insurance sources. Industry, the insurance companies and the AEC should cooperate fully in an endeavor to understand the importance of insurance in the atomic-power program. All possible facts as to

the potential risks should be developed by such a joint endeavor so that a complete understanding as to the amount of insurance needed and the risks involved, based on the available facts, are known. If these facts indicate private insurance capacity is insufficient to cover the risk, then private insurance sources should write insurance up to the limit that it is able to assume and, as I pointed out before, then any excess coverage could take the form of war risk insurance, just to use a term that we are familiar with.

The general consensus of opinion that I have been able to develop is that private industry should do everything within its power to solve as much of the insurance problem as it can before going to the Government. If its best efforts in this direction cannot solve the entire problem, private industry should then accept the minimum amount of Government help which is necessary to solve that problem.

That is the point that I want to emphasize—that Government should not subsidize this insurance protection any more than is necessary to the minimum amount to make such an insurance coverage feasible.

In respect to the question of patents, it is my opinion, further, that section 152 or the Atomic Energy Act of 1954 is somewhat unfair—I might even say very unfair—to the equipment manufacturer, and undoubtedly over a period of time may have the effect of discouraging the manufacturer from investing in research and development of his equipment when such equipment is useful in the production or utilization of atomic energy. This section of the act goes far beyond any requirement of the armed service procurement regulation, which is ASPR–9 or any other Government procurement patent provision, and far beyond established principles of patent law.

This section provides that any invention which is useful (1) to the production or (2) the utilization of atomic energy which is conceived under any contract arrangement or other relationship with the AEC, regardless of whether such contract or relationship involves the expenditure of funds by the Commission, shall be deemed to have been conceived by the Commission, except the Commission may waive its claim under such circumstances as the Commission may deem appropriate.

Now I am perfectly willing to agree right there that if we had perfect administration and breadth of vision at all times this need never cause any trouble, but I am somewhat doubtful as to why it is necessary to tie that article up quite so tightly. If there is the smallest contact by the manufacturer with the AEC, regardless of whether or not there was any financial assistance or other arrangement with the Commission, the title to any patent would vest in the Commission if the Commission saw fit to take such title, even though the invention had general application in the manufacturer's usual field of endeavor outside the atomic energy field.

In accordance with the language of the act, if an invention were made after a general discussion with the AEC on a heat exchanger, for example, by a manufacturer of heat exchangers—I am in that business and that is the reason I am speaking of heat exchangers—and such new heat exchangers were useful in an atomic energy plant, the Commission, if it so desired, could take title to the patent on such invention simply because it can be used in an atomic energy plant. No standards are provided for the Commission to determine when

it is or when it is not appropriate to relinquish patent rights to an inventor when the act otherwise vests title to the patent thereon in the Government.

The provisions of this section place a cloud on the patent rights of any equipment manufacturer who has entered into any type of arrangement with the Commission in the atomic energy field even though no Government funds were involved.

Now, gentlemen, that can be administered properly. I do not think there is any question about it. But the manufacturer in private industry has no rights if the Atomic Energy Commission does not desire to let him have any rights. That is really what it boils down to. I believe that paragraph, by consultation with good patent lawyers, can be written so that no harm need be done either party involved in it and protect the interests of the Government.

Representative DURHAM. Mr. Cole.

Mr. COLE. Does that complete the expression of your viewpoint on the patent provisions of the law?

Mr. MILLS. Only to that limited extent, sir. As I said, I am not a patent expert, but this particular point did appeal to me.

Representative COLE. I mean you have no observation to make with respect to section 153?

Mr. MILLS. Not at the present time, sir. I am submitting a written memorandum.

Representative COLE. Does your silence at this time indicate you approve of section 153?

Mr. MILLS. It does not indicate approval or assent.

Representative COLE. I am glad I raised the question.

Frankly, Admiral, and probably because of lack of information, I cannot share your apprehension with respect to the storage of waste material as being a major factor in getting this thing underway because, as I understand the picture, the normal power-reactor operator is not going to process his own waste material. Therefore, storage of that material by him would not be necessary. Storage of the material by a reprocessor, of course, would be. But, as Mr. Durham has pointed out, that reprocessing phase of this overall operation, for the first few years at least, must necessarily be done by the Government, and the Government will have to provide the storage facilities.

In time, when private capital may enter the field of reprocessing, then the storage factor will be a major item in that particular phase.

Mr. MILLS. It is at that time, Mr. Cole, to which my remarks were addressed, not during the development phase of this problem.

Representative COLE. Now I was intrigued by your statement that after the announcement of the prices by the Commission was made you revised your costs of nuclear power downward by a rather substantial figure.

Mr. MILLS. No, sir, I did not say by a rather substantial figure.

Representative COLE. I know you did not.

Mr. MILLS. I would say by a small percentage.

Representative COLE. You deliberately attempted to avoid the use of percentages, but I considered the percentages which you did use——

Mr. MILLS. To be substantial?

Representative COLE. To be substantial. But the fact that you were justified in revising the cost of power downward is what intrigued me, even though by a very minor percentage.

When you say "revised the cost of power downward," do you mean revised the cost of electric power downward or revised the cost of nucelar fuels downward?

Mr. MILLS. Nuclear fuel downward. The point, in considering the production of heat, up to the point where you deliver the heat to the turbine. You cannot do much, as you know very well, Mr. Cole, from the time your power leaves its generator and goes into the distribution system. I am purely talking of that point which involves the reactor up to the point where it delivers steam to the turbine. Elimination of inventory costs and some contingency charges contributed to the reduction.

Representative COLE. Were the prices announced by the Commission less than you had anticipated they ought to be?

Mr. MILLS. No, sir, I cannot say that they were. I thought they were about in the range that I expected that they would be.

Representative COLE. From your use of the expression that your estimates were revised downward after the prices were announced, it was indicated to me that the prices announced by the Commission were somewhat les than you expected they would be.

Mr. MILLS. No. I think our action is natural, Mr. Cole, because without knowing what your base price is going to be, that you are apt to put more contingencies in your estimates until you find what you can actually count on. I would say that probably we had erred in estimating first on the high side.

Representative COLE. I do not understand why, if the prices as announced were less than you had estimated them to be, then you would revise your costs downward. I should think it would reflect an increase in costs of nuclear fuel.

Mr. MILLS. No, sir. I said the costs were about what I expected they ought to be.

Representative COLE. If the prices were what you expected they would be, then why was it necessary for you to make a revision downward?

Mr. MILLS. I think we had too many contingencies in trying to estimate what we thought the prices might be, including allowances for inventory costs.

Representative COLE. Contingencies, then, on other factors then prices?

Mr. MILLS. No, sir; on the prices we estimated they might be in our original estimate.

Representative COLE. If the prices were what you expected them to be, where is the basis for any revision up or down?

Mr. MILLS. As it turned out, Mr. Cole, the prices were about what I had expected that they should be; but I had thought they might be somewhat higher than that. That is the point I am trying to make, sir, in addition to reducing our estimates of fixed charges due to inventory costs by reason of lease rather than purchase.

Representative COLE. Only for the sake of clearing the record, when you speak of the prices announced by the Commission, which prices are you talking about? Perhaps that is where we have a basis of misunderstanding. Are we talking about the prices that the Government is going to charge you for the use of the fuel or the prices the Government is going to pay you for the material you make?

Mr. MILLS. For the fuel that we lease, sir, and are charged for. The material that we make may compensate up or down depending on prices paid us by Government.

Representative COLE. Do you recall the testimony of Mr. Cisler on the subject of the Government prices?

Mr. MILLS. Yes, sir.

Representative COLE. It is my recollection he said that the Government prices were about half of what his group had estimated they would be.

Mr. MILLS. You are talking about fuel prices now, sir?

Representative COLE. The prices of fuel.

Mr. MILLS. Not the prices of special material?

Representative COLE. That is the fuel.

Mr. MILLS. Yes, sir, fuel prices. He thought they were about half, as I recall.

Representative COLE. That is right.

Mr. MILLS. In his testimony. I cannot agree with Mr. Cisler on that. Actually I thought they were pretty much in the range I expected that they should be during the first period of time on a lease basis. Considering returnable special materials I feel that the announced prices are lower than we thought they should be.

Representative COLE. I frankly do not understand your mental reasoning or what the factors were that caused you to draw the conclusion when you say:

> These prices have caused us to revise our estimated costs of nuclear power downward below those obtained a year ago.

Apparently from our discussion, I am not going to be able to understand it. Through no fault of yours.

That is all.

Senator KNOWLAND. Might it not be possible, Mr. Cole, the prices were what he thought they should be but he feared they might be higher in arranging their own costs?

Mr. MILLS. I think that is as simple as I can put it, sir—that I thought the prices in making our original estimates might be higher, but I hoped they would be somewhere in the range in which they were finally expressed. That is what I am trying to say.

Representative COLE. Thank you very much, Senator Knowland.

Senator PASTORE. It is too bad you did not say that in the beginning.

Mr. MILLS. I am sorry I seem to be so obtuse, Mr. Cole.

Representative DURHAM. Senator Hickenlooper?

Senator HICKENLOOPER. No questions.

Representative DURHAM. Senator Gore.

Senator GORE. No questions.

Representative DURHAM. Senator Knowland.

Senator KNOWLAND. No questions.

Representative DURHAM. Mr. Price.

Representative PRICE. No questions.

Representative DURHAM. Thank you very much, Admiral.

Mr. MILLS. It is a pleasure to appear before you gentlemen.

Representative DURHAM. Is Mr. Joseph Ehlers here?

Mr. EHLERS. Yes, sir.

Representative DURHAM. Come around to the witness table, Mr. Ehlers. You may proceed with your statement.

STATEMENT OF JOSEPH H. EHLERS, FIELD REPRESENTATIVE, AMERICAN SOCIETY OF CIVIL ENGINEERS

Mr. EHLERS. My name is Joseph H. Ehlers. I am field representative of the American Society of Civil Engineers.

I am appearing to submit for the record a resolution on control of waste material from nuclear energy utilization which was adopted by the board of directors of the American Society of Civil Engineers on February 7, 1955.

The resolution is as follows:

Resolved, That the American Society of Civil Engineers recommends that in further modifications of the Atomic Energy Act, or in any AEC regulation to implement existing legislation: (1) the inherent responsibilities of the States and the United States Public Health Service in their respective jurisdictions for the protection of Health and for supervision and control of the disposal of radioactive wastes and protection of water resources should be specifically recognized in this act; and (2) the Atomic Energy Commission should be clearly authorized to encourage and assist State health departments and other responsible agencies, by training and other means to develop their knowledge and competency and to assume responsibility for health and safety aspects of nuclear-energy operations—

Mr. Fuhrman, who was scheduled to testify for the ASCE, and others are here on behalf of some of the specialized engineering groups in the field of sanitary engineering and are prepared to elaborate on this simple policy statement.

Representative DURHAM. Does that complete your statement?

Mr. EHLERS. That completes my statement.

Representative DURHAM. Thank you very much, Mr. Ehlers.

Representative COLE. Mr. Chairman, are we going to have further representatives of the society?

Representative DURHAM. Yes. The next witness is Mr. Harry Jordan. Will you please proceed, Mr. Jordan?

STATEMENT OF HARRY E. JORDAN, SECRETARY OF THE AMERICAN WATER WORKS ASSOCIATION

Mr. JORDAN. My name is Harry E. Jordan. I am secretary of the American Water Works Association. By direction of its officers and directors, I present to your committee certain opinions which we conceive to be in the public interest.

The association has a membership of more than 10,000 persons engaged in the design, construction and/or management and operation of public water-supply works. We serve a hundred million town and city dwellers in the United States. Throughout the 75 years of our organized activity, we have had as our major concern, the health and safety of water users. Our association maintains close contact with the health agencies in the various States and the United States Public Health Service at the national level.

For purposes of consideration of national problems of common interest we have set up a joint policy committee of American Water Works Association, Federation of Sewage and Industrial Wastes Associations, and Water and Sewage Works Manufacturers Association. Certain resolutions which follow are supported by the joint policy committee and confirmed for the association by the officers and direc-

tors of the American Water Works Association. We are proposing certain amendments to the Atomic Energy Act of 1954 which, in our opinion, are consistent with long-term public-health-protection policy of the States and the Nation.

The 1954 act shows the concern of the Congress with public health and safety—since it contained 17 references to the matter. But the act charges the Atomic Energy Commission with this responsibility and does not take into account the experienced and responsible agencies at the National and State levels which have been, over a long period of years, charged with administrative responsibility in the field of public health.

In 1950, Dr. Abel Wolman, an internationally distinguished figure in the sanitary engineering and public-health field, who was then and still is a consultant to AEC, stated in an address before the American Public Health Association:

> The United States Atomic Energy Commission pointed out in its report for the first 6 months of 1950 that "in such large concentrations of material, either naturally radioactive or made so in various operations of the program, these same types of radiation create potential hazards." Workers must be protected against them when they are generated in manufacturing processes. The public must be protected by safe handling of the unique industrial wastes. Special safeguards must be set up and maintained in research that involves radioactive material or release of radiation.
>
> As the activities of the Commission have grown and as the uses of its products have expanded, one would suppose, at least in theory, that the area of public health agency interest and responsibility would have been correspondingly extended. It has been accepted as axiomatic in public-health practice that official public-health agencies generally should assume responsibility for control of those activities which have more than a single individual impact or significance.
>
> The atomic-energy program is now sufficiently widespread to result in exposing large numbers of individuals to beneficent as well as to malign potential effects of radiation. Since the numbers so exposed are likely to increase rather than to decrease, the areas of operations have assumed a public health significance.
>
> Some have said that the problems are so complex that a Federal health agency should look after it and let both information and control filter downward to, rather than upward from, the local areas, a departure from principles hitherto controlling in this country.
>
> Without attempting to diagnose the basis for this position, it may be predicted that it too will prove to be untenable, for, as the uses expand and the difficulties increase, the public will require more rather than less local supervision and control.

In a paper jointly prepared by Dr. Wolman and Arthur Gorman, sanitary engineer of the AEC, and presented before the American Society Mechanical Engineers at its 1954 meeting in New York, the authors conclude:

> The problems in waste disposal for the atomic-energy industry are many. The control of waste is currently adequate, but quite expensive. As the industry expands, especially in the power field, less expensive methods will be required if atomic energy is to compete favorably in cost with other fuels. Anticipating this situation, the AEC has placed research and development contracts with universities, private industry, the national laboratories and other Federal agencies to evaluate various waste-disposal methods and particularly the extent to which the ground, surface waterways and the air may be used to store, shield, dilute, and disperse radioactive wastes.

The Atomic Energy Commission through diligence and vigilance has avoided any dangerous escape of radioactive material from its installations but has not yet found feasible any conventional method of disposing of its dangerous wastes.

The National Bureau of Standards has considered the waste disposal problem so serious and so incapable of solution by conventional methods that it has published a manual of disposal of radioactive wastes at sea.

It may appear to your committee that, in view of the good record of the AEC in its own installations and operations, our concern over public health and waste disposal is gratuitous. Quite the contrary—the Atomic Energy Act of 1954 opened the door to licensing civilian installations and operation of nuclear reactors and industrial use of radioactive materials.

Confining ourselves to the nuclear reactor phase of the matter, we have observed that, in the voluminous releases of promotional material on the subject by the electric utility industry, nothing has been said about the problem of disposal of waste reactor material.

Arthur Gorman, sanitary engineer of the AEC, in an address before the National Industrial Conference Board in New York in 1954 said in part:

> Newcomers to the atomic-energy industry will want to give special consideration to disposal of wastes and waste products and the potential environmental problems resulting from their release. Industrial teams that have studied the industry to date may not have given disposal of its wastes the attention it deserves from the standpoint of costs and public relations. It is understandable that their interest may have been centered on the more fascinating areas of reactor technology and evaluation of commercial possibilities in the use and application of atomic energy. But it would be a great disservice to their sponsors if they fail to face the back-door realities of planning and operating a nuclear reactor or chemical processing plant.
>
> The problem of integrating the new atomic-energy industry into the national industrial and community complex rests in no small degree on our ability to live with radiation without damage to life and property. Decisions on disposition of radioactive material call for the best judgments of experts in the effects of radiation, the chemical properties of the isotopes concerned, the characteristics of the wastes as released, and their ultimate fate in nature depending on whether release is to the air, the ground, or to surface waterways.

We recognize and pay tribute to the Atomic Energy Commission for the diligent conduct of its basic duties. We note with approbation the extensive program of research re decontamination of radioactive wastes which the Commission has supported.

However, it is our opinion, that with the widening application of reactor practices in the hands of licensed civilians, the problem of safety control widens at an accelerated rate. We, therefore, conclude that the protection of public health and safety, outside the installations of the AEC itself, should be definitely assigned to lifetime specialists in public health administration.

This opinion is expressed in the following resolution:

> Whereas the expanding development of nuclear energy and nuclear materials including their commercial and industrial utilization, as authorized by the United States Atomic Energy Act of 1954 will involve major problems in the control of waste materials so as to prevent significant health hazards from the planned disposal or accidental release of contaminants to the environment; and
>
> Whereas it is particularly important that water pollution or other impairment of surface or ground water resources be prevented; and
>
> Whereas State and local health departments and other agencies in the several States and the United States Public Health Service have legally delegated responsibilities for protection of the health and safety of the public, including supervision over the control and disposal of industrial and other waste materials, which responsibilities must be recognized; and

Whereas for many years State and local health departments, the United States Public Health Service, and other agencies have studied the problems of water pollution, and have developed technical and administrative procedures for the control of waste materials and other environmental contaminants and, in many States, for supervision over the development and use of water resources: Therefore be it

Resolved, That the organizations below listed recommend that in further modifications of the Atomic Energy Act (1) the inherent responsibilities of the States and of the United States Public Health Service in their respective jurisdictions for the protection of health and for supervision and control of the disposal of radioactive wastes and protection of water resources should be specifically recognized in this act, and (2) the Atomic Energy Commission should be clearly authorized to encourage and assist State health departments and other responsible agencies, by training and other means, to develop their knowledge and competency and to assume responsibility for health and safety aspects of nuclear energy operations.

This resolution has been officially approved by the Joint Policy Committee of—
American Waters Works Association.
Federation of Sewage and Industrial Wastes Associations.
Water and Sewage Works Manufacturers Association.
Conference of State Sanitary Engineers.

We venture the opinion that your committee will not object to our making certain definite suggestions concerning the text of the amendments we support.

We also suggest that there be added to chapter 10 following sections 103 and 104 the following new section:

Every licensee under this act who holds a license from the Commission for the commercial or industrial utilization of nuclear material, medical therapy, or research and development shall be subject to the supervision and regulations of any State public health department and/or water pollution control agency having jurisdiction, and shall also be subject to the jurisdiction of the United States Public Health Service under the terms of Public Law 845 or its successor act, with respect to the control and disposal of waste materials.

The addition of the above may lead your committee to clarify the present language in section 103 (b) and section 104 (b) and (c). We have also noted the phraseology of sections 271 and 272 of the 1954 act. They read as follows:

SEC. 271. AGENCY JURISDICTION.—Nothing in this Act shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power.

SEC. 272. APPLICABILITY OF FEDERAL POWER ACT.—Every licensee under this Act who holds a license from the Commission for a utilization or production facility for the generation of commercial electric energy under section 103 and who transmits such electric energy in interstate commerce or sells it at wholesale in interstate commerce shall be subject to the regulatory provisions of the Federal Power Act.

We suggest the following new section to follow 271:

SEC. * * * AGENCY JURISDICTION.—Nothing in this Act shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to control of environmental health hazards or the protection of water resources.

We have also noted that while the Western States have for a long period had on the statute books, laws governing the appropriation and use of water, many of the 1955 State legislatures in the East are considering the enactment of similar legislation. There are today very few places in the United States where a development of an industrial plant involving use of such large quantities of water can be accomplished except through permit from a State agency which controls the allocation and use of water. Since licensed nuclear reactors are

of necessity large users of water, the following addition to follow section 271 the amended act is suggested.

SEC. * * * WATER RIGHTS.—Nothing in this Act shall be construed to affect the authority or regulations of any State agency or the validity of any State legislation governing the rights to, the development of, or the use of water resources.

We appreciate your courtesy and bespeak your affirmative consideration of the above suggestions.

Representative DURHAM. Thank you, Mr. Jordan. Are there any questions? If not, the next witness will be Mr. Ralph Fuhrman.

Mr. Fuhrman, will you come around? You have a statement, have you not?

Mr. FUHRMAN. Yes, sir, a brief statement. I believe you have copies of it. It is just a single page mimeographed.

Representative DURHAM. You may proceed.

STATEMENT OF RALPH E. FUHRMAN, EXECUTIVE SECRETARY, FEDERATION OF SEWAGE AND INDUSTRIAL WASTES ASSOCIATIONS, CHAMPAIGN, ILL.

Mr. FUHRMAN. Thank you, Mr. Chairman. My name is Ralph E. Fuhrman, executive secretary of the Federation of Sewage and Industrial Wastes Associations.

We consider it a privilege to offer this brief statement in connection with your hearing devoted to improvement in the Atomic Energy Act of 1954. The provisions of the act as to the protection of the health and safety of the public have kept responsibility for this protection with the Atomic Energy Commission. This has been a satisfactory basis of operation in the past. However, with the greater distribution of radioactive material which the immediate future seems to hold, it is likely that continuation of this policy will not be fully effective in protecting the health and safety of the public.

The Federation of Sewage and Industrial Wastes Associations is made up of 38 associations, mostly State organizations in the United States, whose 6,300 professional and technical members deal with problems arising from the disposal of water-carried wastes. While the overall surveillance of this problem is a health department function, those affiliated with this federation have given the problem wide attention through research, experimentation, and study. Physical systems which the future will demand for the control of radioactive wastes will probably be designed and operated by members of this group.

The Journal published by the Federation, Sewage and Industrial Wastes, has carried and will continue to carry technical articles in the field of radioactive waste disposal to inform its readers of the problems and progress in the field.

We are well aware of the severe technological limitations in the removal of radioactive materials from the wastes of nuclear operations. With reasonable expense it is possible to treat water, whether used or not, to overcome excessive quantities of undesirable bacterial, chemical, or physical constituents. With radioactive waste the new dimension of time becomes controlling and tends to govern completely the disposal techniques.

This characteristic of atomic wastes along with the development toward nuclear powerplants make additional protection to the public essential. In cooperation with other organizations having similar interests, this federation has endorsed the suggestions being presented by Mr. Harry E. Jordan, secretary of the American Water Works Association. These suggestions maintain the prime responsibility of health protection as belonging to the Atomic Energy Commission for its installations and designate the United States Public Health Service and State health departments for interstate and intrastate problems, respectively.

This arrangement is thoroughly logical and would combine the advantage of maximum protection and lowest administration cost.

Thank you very much.

Representative DURHAM. Does that complete your statement?

Mr. FUHRMAN. Yes.

Representative DURHAM. Thank you very much, Mr. Fuhrman.

Are there any questions by members of the committee?

Representative PRICE. I see the gentleman is from Illinois, so I suppose I should ask him some questions.

What are the circumstances that led to the interest of your organization in this problem?

Mr. FUHRMAN. Members of the organization were thrown into it from their professional associations—sanitary engineers in the Public Health Service, sanitary engineers working for the industries, like the Oak Ridge organization and such things. We are devoted to stream sanitation, in a sense, in keeping streams as clean as we can so they can serve the public and industry for water supplies farther along in time or distance.

Representative PRICE. I know the Association of America Waterworks throughout the United States is interested. Have there been any specific problems arising in any of the areas around these atomic plants that has caused their great interest in this?

Mr. FUHRMAN. I am not aware of the details of such problems. I believe they have existed, but I do not think they have been publicized to the extent that I have gotten them.

Representative PRICE. That is all.

Representative DURHAM. Are there any further questions?

Thank you very much, Mr. Fuhrman.

The next witness is Mr. Noel Chamberlin. Please proceed, Mr. Chamberlin.

STATEMENT OF NOEL S. CHAMBERLIN, REPRESENTING THE WATER AND SEWAGE WORKS MANUFACTURERS' ASSOCIATION, INC., NEW YORK CITY

Mr. CHAMBERLIN. This statement refers specifically to some 17 clauses in the Atomic Energy Act of 1954 charging the Atomic Energy Commission with the responsibility of protecting the health and safety of the public. The interest of the Water and Sewage Works Manufacturers' Association rests with those who may, by license under the act, be granted authority to install and operate nuclear reactors or use radioactive material for medical and industrial practice and research.

In view of this possibility, it is the stand of the Water and Sewage Works Manufacturers' Association that the regulatory bodies and agencies, now in existence for the purpose of protecting the public health, should be charged with the responsibility for the protection of the public health and safety as it pertains to industries using atomic reactors or to users of radioactive materials and that this be so specified in the language of the Atomic Energy Act. Also, that the Atomic Energy Commission, like other industry, be held responsible for the prevention of water pollution and for the protection of the public health and safety.

The Water and Sewage Works Manufacturers' Association is eminently qualified to recognize the sense of such a stand. Their clientele are mainly those engaged in the art of treating waters for industrial and potable drinking purposes and in treating waste waters for compliance with the rules of the regulatory agencies.

The above stand is not based upon any business consideration, for that has no bearing on such a position, but upon technical considerations evolving from our association with our clientele and the fact that we, as manufacturers, have our own pollution problems. Each consideration has brought us into intimate contact with the Federal, interstate, and State agencies charged with the problem of the control of pollution abatement.

The Water and Sewage Manufacturers' Association is fully aware of and familiar with the work of the United States Public Health Service, particularly since the enactment of Public Law 845 of June 1948, commonly called the Water Pollution Control Act, administered by the Surgeon General. Under this act, the United States Public Health Service is to support and aid technical research in certain specified fields and collect, disseminate, and make available results of the work conducted by the service and cooperating agencies. The pollution problem has been surveyed and evaluated by the United States Public Health Service since 1949. It has brought to light the presence of some 20,000 sources of pollution. With this has come the realization of the problems of a technical nature that must be solved before many of the needed waste treatment plants can be built. Through the efforts of the United States Public Health Service and funds from the Federal Security Administration this is gradually being accomplished.

In the specific matter of atomic wastes, the United States Public Health Service has played a leading role. This organization has become the expert on the matter of detecting, monitoring, and treating these wastes. Their employees have been loaned to and are continuously working with the Atomic Energy Commission at their various installations. By law, the Surgeon General must encourage cooperative State action and for atomic wastes this has been fulfilled by passing on to the State agencies the findings on the same and by training State agency personnel. The United States Public Health Service has done a commendable job in obtaining an disseminating atomic information to the pollution control agencies, both interstate and intrastate.

Most of the States have enacted pollution control laws under the auspices of the various State boards of health or State stream pollution control commissions. They have done an admirable job. Over one-third of the States have or are in process of classifying the streams

and setting standards for them. In this the United States Public Health Service has rendered vital assistance. The State agencies, along with assistance from the several interstate agencies of which many States are members, have been chiefly responsible for the completion of some 3,650 industrial waste treatment plants, with 500 being planned and 2,100 to be built in the next 5 years.

These observations testify to the excellent job that the existing agencies have done in obtaining and supplying the information so essential to getting stream pollution abatement on a sound footing. No small part of the success is due to the splendid cooperation of the Federal, interstate, and State agencies with each other and with industry in getting the plants built to protect the public health. There definitely is no need for creating new agencies for the protection of the public health from the standpoint of water pollution.

In a résumé of the 1948 Water Pollution Control Act in volume III of the President's Water Resources Policy Commission, authorized January 3, 1950, it is stated that it is the declared policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of the States in controlling water pollution, to support and aid technical research, to devise and perfect methods of treatment of industrial wastes when no effective method exists, and to provide Federal technical services to State and interstate agencies and its industries.

Thus, with the States being recognized as having the right to control the pollution by atomic wastes within their boundaries and with the technical services on atomic wastes being provided by the United States Public Health Service as noted previously, there is no doubt that the States have the right to and qualifications for taking primary responsibility for the control of atomic wastes treatment and the prevention of pollution resulting therefrom within their just jurisdiction. In those cases where companies are using atomic reactors or radioactive materials and have an interstate aspect, the responsibility for pollution control is properly that of the United States Public Health Service.

As manufacturers, the Water and Sewage Works Manufacturers' Association is also fully aware of industrial cooperation with the above agencies. Industry has cooperated by supplying technical services and research, by setting up industrial committees within the agencies, particularly interstate, and giving its knowledge to the agencies for use on a national basis. In turn, the industries have been most grateful for the efforts of the United States Public Health Service in evaluating the pollution from the national viewpoint, of their cooperation with the States in classifying the streams and setting up stream standards. Industry, in getting the desired specifications, set in numerical values for specific localities, is then able to evaluate its wastes in terms of the amount and treatment required to give waste discharges that can be tolerated. The direct assistance of the United States Public Health Service with the Atomic Energy Commission has, in this respect, been a very satisfactory arrangement.

The Water and Sewage Works Manufacturers' Association is fully aware that industry as a whole makes no request that it be relieved of responsibility in the abatement of stream pollution. There is no question that the Atomic Energy Commission is cognizant of its responsibility for the wastes from its installations and that such responsibility for protection of public health and safety and prevention of water

pollution is rightly and justly theirs, as it is the responsibility of other industries discharging pollutants to our streams.

Representative DURHAM. Thank you, Mr. Chamberlin.

The committee stands adjourned until 2 o'clock tomorrow.

(Whereupon, at 3:05 p. m., Tuesday, March 1, 1955, the Joint Committee recessed until 2 p. m. Wednesday, March 2, 1955.)

DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

WEDNESDAY, MARCH 2, 1955

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The Joint Committee met at 2 p. m., pursuant to recess, in room P–63, the Capitol, Representative Carl T. Durham (vice chairman of the Joint Committee) presiding.

Present: Representative Durham (vice chairman), Senators Pastore, Gore, Hickenlooper, and Millikin; and Representatives Holifield, Cole, Price, and Patterson.

Present also: Corbin C. Allardice, executive director, George Norris, Jr., counsel to the Joint Committee, and Walter A. Hamilton, of the professional staff of the Joint Committee.

Representative DURHAM. The Joint Committee will be in order.

This is a continuation of the statutory hearings begun some time ago, and today we have before us Mr. Leland Olds.

Mr. Olds, will you come around? We are glad to have you with us. Do you have a written statement, Mr. Olds?

Mr. OLDS. Yes, I have.

Representative DURHAM. Will you proceed to give your statement.

STATEMENT OF LELAND OLDS, FORMER CHAIRMAN OF THE FEDERAL POWER COMMISSION

Mr. OLDS. Mr. Chairman, I appreciate the opportunity to appear here today to discuss matters affecting the development, growth, and state of the atomic energy industry.

On May 4, 1954, I appeared before this committee to discuss proposed amendments to the Atomic Energy Act of 1946, embodied in a bill (H. R. 8862) which, after changes made in both Houses and further revisions in conference, became the Atomic Energy Act of 1954.

At the 1954 hearing I emphasized the importance of bringing the development of atomic power under the traditional power policy of the Nation, which has proved such an effective protection for the public interest in abundance of low-cost power. I suggested that the pattern of policy had been worked out over many years in dealing with the people's waterpower resources and that it seemed unnecessary to begin all over again in connection with the development of nuclear power.

Today I will emphasize the need for further amendment of the Atomic Energy Act, as well as for undertakings, under the present act, to assure the full effectiveness of American power policy in connection with the development of atomic power.

Atomic power policy: In the first place, in order that the subsequent discussion may be understood, we should have a clear picture of what constitutes American power policy. In my statement last year to the committee I dealt with this question at some length. In order to save the time of the committee I will merely summarize my previous remarks here, with the request that the full statement be incorporated in these hearings by reference. Last year I pointed out that:

(1) American policy governing the business of supplying electricity is embodied in laws involving local and State governments, as well as the Federal Government, and is based on the unquestioned right of American communities to choose public or cooperative ownership, as well as to authorize private ownership of the electric service business. Historically, a considerable proportion of the electric business has always been performed by publicly or cooperatively owned electric systems.

(2) This right of the people to choose public or cooperative ownership of their electric service systems has proved an invaluable supplement to utility regulation in providing an effective check on the tendency of private monopolies to maintain high rates and to restrict service. In fact, regulation unsupported by public or cooperative competition has largely failed to provide a substitute for competition in assuring electric consumers the fullest opportunity to use their resources.

(3) Federal power policy, as applied to development and utilization of the people's hydroelectric resources, has been based on recognition of this important American tradition of combined public, cooperative, and private ownership in the field of electric service, with encouragement of public or cooperative ownership as a necessary supplement to regulation of private power systems where these would otherwise enjoy a monopolistic control of the power supply of an area or a region.

(4) The Federal Power Act (originally enacted in 1920 as the Federal Water Power Act) established the conditions governing the development and use of waterpower resources subject to the jurisdiction of Congress. It provided for the licensing of non-Federal development of such resources, subject to strict Federal regulation of licensees, but it provided an unconditional preference for Federal development of any given resource and, after the Federal Government, for public development by a State or municipality. In addition, it limited the license period and provided the opportunity for recapture on a net investment basis, either by the Federal Government or an interested State or municipality, at the end of the license period.

(5) A series of subsequent acts implemented the public development alternative envisaged by the Federal Power Act. These included the congressional resolution of 1927 directing the Corps of Engineers to survey all rivers of the country and develop broad plans for their development for flood control, hydroelectric power, and other purposes; the Boulder Canyon Act of 1928; the Tennessee Valley Authority Act of 1933; the Rural Electrification Act of 1936; the Bonneville Power Administration Act of 1937; the Flood Control Act of 1938; the Fort Peck Act of 1938; the Reclamation Act of 1939; and the Flood Control Act of 1944. All of these, as well as many annual

flood control and river and harbor acts, together with Interior Department and Army civil functions appropriations bills, provided for Federal development of hydroelectric power and its marketing with a preference to public and cooperative systems, including arrangements for delivery of low-cost power to such systems.

In my summary I referred to history as showing that a considerable proportion of the electric power business has always been performed by public or cooperative electric systems. Actually there were 4 public systems when central station electricity was born in the year 1882, the number rising to over 3,000 by 1923. Latest statistics show about 3,000 public and cooperative rural electric systems serving well over 10 million customers or members representing at least 20 percent of the country's population.

Furthermore, at the end of 1953 there were 11,358,000 kilowatts of Federal generating capacity and 8,906,000 kilowatts of State, municipal, public utility district, and cooperative generating capacity in operation. And it may be noted that if we deduct the huge defense loads carried by the Tennessee Valley Authority and the Bonneville Power Administation, the electricity generated for utility load by State and local public agencies closely parallels that generated by Federal projects.

I cite these figures to suggest that it would be a serious oversimplification for legislation or administrative action, dealing with the use of atomic energy for the generation of power, to proceed on the assumption that regulated private enterprise alone truly represents American power policy. Applied to Federal responsibility in the field, this would ignore the fact that Federal power policy has grown up as an integral part of a broader scheme having its roots in the right of local communities to choose public or cooperative electric service if they consider that this will best meet their needs.

I turn now to the fact that public competition supplements regulation.

In my summary I also referred to the fact that the right of the people to choose public or cooperative ownership of their electric systems has proved an invaluable supplement to utility regulation by providing an effective check on the tendency of private monopolies to maintain high rates and restrict service.

Some further amplification of this is necessary here as a basis for recommendations that both the atomic energy law and its administration give full effect to the American power policy which I have described.

This becomes particularly important because the committee already has heard testimony to the effect that regulation will protect the interest of consumers in low-cost atomic power, as well as statements suggesting that the harnessing of nuclear energy per se may prove the solution of New England's high electric rate problem.

Thus we find Mr. Walker T. Cisler, president of Detroit Edison Co., testifying to such protection of the consumer interest (hearings, p. 227). Looking ahead with the caution which apparently characterizes private enterprise in the atomic field, he says that he fully expects the development to progress, sometime later—

> to the point where reductions in the costs of producing power and supplying it to the customer will be realized.

He continues:

> You may be sure that when that time comes the savings will be properly reflected in rate schedules. The State public service commissions may be depended upon, if necessary, to audit the utilities' accounts.

The entire history of the power industry in America shows that utility regulation cannot be depended upon to protect the public interest in low-cost electric power in abundance unless supplemented by such public and cooperative competition as the power policy which I have been summarizing provides. And it is now nearly 20 years since the Federal Trade Commission, in its Summary Report on Utility Corporations, No. 73–A, said:

> An important part of the industry's propaganda against municipal or Government ownership has been the sedulous cultivation of the idea in the public mind that the existing regulatory mechanism was both sufficient and efficient as a middle course between the two extremes of public and private monopoly.

I shall not take the time of the committee with an extended discussion of the reasons why regulation has proved ineffective. But I will merely point out that the fundamental weakness of regulation is due to its static approach to determination of reasonable rates. The regulatory approach consists largely in determinations as to whether the profits on last year's limited business represent more, or less, than a fair return on some rate base.

Where there is no competition, regulation lacks cost standards as a basis for rates. In general, it must assume that the actual costs shown on the books of the companies are reasonable and cannot base rate orders on the important fact that unit costs of electric service come down rapidly when a dynamic sales policy causes rapid increase in average sales.

In my last year's statement to this committee, I quoted at length, in support of this conclusion, from a symposium on power costs, sponsored by the American Society of Civil Engineers. On that occasion both Leverett S. Lyon, then vice president of Brookings Institution, and Prof. B. Alden Thresher of the Massachusetts Institute of Technology, definitely related the broadening of Federal power policy to the inadequacy of regulation. Lyon attributed the introduction of the TVA "yardstick" policy to the lack of any satisfactory cost basis for fixing rates under regulation. And Thresher suggested that the accepted scheme of regulation in the United States is, by its very nature, static and ill-adapted to the economic and technical changes characteristic of the power industry.

There is no more enlightening discussion of the kernel of the issue than is found in an editorial in the Electrical World, which is a trade journal of the electric power industry. In its issue of June 25, 1943, the editor suggests that the electrical industry must substitute the concept of competition for the outlook of monopoly, if the opportunity of private enterprise in the business is to be preserved. He said:

> In a competitive business, there is the same eagerness to secure a fair return on invested capital, but the approach is different. Return in competitive business comes from expansion of sales—from volume. * * *
>
> In a competitive business one does not start with a rate that will produce a return and struggle to build business at that price. Just the opposite; one sets a goal and then finds out what price is necessary to reach that figure. The costs are adjusted to make the price bring a return on the estimated volume.

What is the difference? Just this, that growth under the monopolistic concept is necessarily slower than under the competitive concept. Rates in one case are protective of investment, while in the other, they are volume creative. * * *

This is a precise statement of the changes in management outlook which is fostered by the Federal power policy which Congress has developed over the years based on the simple right of American communities to choose their form of power supply. It can be shown that it is not so much excessive profits as it is a shortsighted sales policy on the part of private power monopolies which is responsible for high electric rates.

Now, before calling your attention to a few examples of the effectiveness of public competition, as a supplement to utility regulation, I would like to make it very clear that this aspect of American power policy—the "yardstick" principle—was operating long before the establishment of the TVA. In fact, the Federal Trade Commission investigation of electric utilities, to which I have already referred, reveals the extent to which private power companies, organized into the Insull-dominated National Electric Light Association, felt the pressure of this public competition during the 1920's and sought to eliminate it. Public power systems like Jamestown, N. Y., Cleveland, Ohio, Springfield, Ill., Hannibal, Mo., Kansas City, Kans., Rochester, Minn., Los Angeles, Calif., and Seattle and Tacoma, Wash., to mention a few, were already providing important rate and service yardsticks before the TVA was launched. And the very successful Ontario Hydroelectric Power Commission, distributing through municipal systems and rural districts just across the border in Canada, was proving a constant source of embarrassment, as well as a spur, to private power enterprise in the United States.

The next subject is examples of public competition supplementing regulation.

There are many examples of the effectiveness of public competition in bringing reductions in rates charged by privately owned utilities which regulation failed to accomplish. A simple illustration is found in Illinois where, with an active State public service commission, the residential bill for 250 kilowatt-hours a month use charged by the Central Illinois Light Co. rises in direct proportion to the distance of the area served from the Springfield area, where the private company competes with the Springfield municipally owned system. The Federal Power Commission's Typical Electric Bills report for 1954 shows this private company charging $5.22 in the competitive Springfield area, $5.78 some 60 miles away in the Peoria area, and finally $7 some 100 miles beyond Peoria in the DeKalb area, all for the same service.

The same Federal Power Commission report reveals a similar illustration in Michigan, which is of particular interest because of its bearing on Walker Cisler's assurance that State commission regulation would guarantee consumers the benefits of low-cost atomic power. Some years ago, Mr. Cisler, president of Detroit Edison, tried to get legislation amending the Federal Power Act to enable him to engage in interstate commerce without becoming subject to Federal regulatory jurisdiction. He failed, so the people of his service area do not have the advantage of possible lower power costs through more widespread pooling of power. In other words, his company, in order to avoid regulation, has failed or refused to interconnect with the sys-

tems south of Michigan in Indiana. But he did get a special law passed exempting Detroit Edison from such jurisdiction when it made its international connection with the publicly owned Ontario Hydroelectric Power System, and celebrated by unveiling a plaque, inscribed "Partners in Progress."

Using residential bills for 250 kilowatt-hours a month for comparison, as we did in the Illinois example above, we find that Detroit Edison charges $7.74 for this service, considerably above the $7.02 United States average. But in terms of our review of the effectiveness of public competition, the significant fact is that Detroit Edison's $7.74 bill for this service contrasts with $6.45 charged for the same service by Consumers Power Co., which serves most of the State of Michigan outside the Detroit metropolitan area.

An examination of the Federal Power Commission report shows that Consumers Power is in competition with municipally owned electric systems in Bay City (population 58,000), Kalamazoo (population 58,000), Traverse City (population 17,000), and Zeeland (population 3,000). The able-managed municipal electric system serving Lansing (population 92,000) is also close to its lines.

But, as final evidence of the effectiveness of public competition, the FPC report shows that, although Consumers Power raised its rate for this service, practically throughout the State, from $5.95 in 1944 to today's $6.45, in Bay City where the municipally owned system reduced its rates from $6.75 to $5.80 in the 10-year interval the big private company is also charging $5.80. In other words, where there is direct competition with a progressive public system, Consumers Power is charging $69.60 a year for the same service for which a home served by Detroit Edison must pay $92.88—a difference of about $23 a year for that service.

Senator PASTORE. I have a question there. Is there any difference in the paying of taxes? That argument is usually made.

Mr. OLDS. They both pay private company taxes.

Senator PASTORE. Do they pay taxes to the Federal Government in both instances?

Mr. OLDS. In both instances they do.

Senator PASTORE. That cannot be used as an argument.

Mr. OLDS. No. This is where you are comparing equals as far as the Federal income-tax law is concerned.

Senator PASTORE. Thank you, sir.

Representative HOLIFIELD. Could I ask you a question there. In your second paragraph you mention Detroit Edison purchasing from Ontario Hydroelectric System. I assume that is in Canada.

Mr. OLDS. Across the border, yes.

Representative HOLIFIELD. What do they pay for their power?

Mr. OLDS. I do not know what the charge is which is made. It is worked out on an interchange basis. In other words, at the times when the Ontario Hydroelectric System has surplus hydropower, it flows in to Detroit and displaces steam power. At the times when Ontario Hydro's water is low for its hydro projects, Detroit Edison power flows the other direction from its big steam stations.

Representative HOLIFIELD. Can you answer this question: What is the rate the Ontario Hydroelectric Power System charges its consumers?

Mr. OLDS. The rate for this service that I am talking about, it is my recollection—I can look it up for you—is $3.33 in Windsor just across the border in Canada—a little less than half what is charged in Detroit. Actually, the last time I looked at the figures, the people in Windsor, Ontario, were using 286 kilowatt-hours a month, more than 3,000 a year. They were getting that 286 kilowatt-hours for less than people in Detroit had to pay for 100 kilowatt-hours, or only just a little over one-third as much power.

I point out here that it will be interesting to watch the results of the Detroit Edison Co's. interconnection with the publicly owned Ontario Hydroelectric System at Windsor, Ontario, where homes get this service at less than half the Detroit bill.

A similar illustration, on a much broader scale, is found in a map of the United States, contained in the Federal Power Commission typical bills report, showing the average bills for 250 kilowatt-hours of residential use of electricity in the several States. In general, the map shows clearly that the bills become higher and higher as the distances from the influence of the TVA system in the Southeast and the Bonneville system in the Pacific Northwest increase. Thus, moving northeastward from the TVA, the bills are $4.92 in Tennessee, $6.47 in Kentucky, $7.23 in West Virginia, $7.34 in Pennsylvania, $7.81 in New York, and between $8.00 and $8.85 in all the New England States except Connecticut. Similarly, moving northwestward from the same starting point, the bills are $4.92 for Tennessee, $6.59 for Illinois, $7.97 for Iowa, $7.74 for Minnesota, and $8.46 and $8.28 for South and North Dakota, respectively.

Maps issued by the Director of Information of the Tennessee Valley Authority tell the same story by showing for 1932 and 1952, in concentric areas surrounding the TVA area, the average typical bills for 100 kilowatt-hours monthly residential use of electricity. These maps show that, before TVA, the level of rates decreased slightly from a high of $5.26 in Tennessee to $4.97 in the first band, $4.73 in the second band, $5.07 in the third, and then down to $4.90 in the fourth. After 20 years of TVA influence, the trend had been reversed so that, beginning with $2.50 in the TVA market area, the average rises to $3.24 in the first band, $3.61 in the second, $3.83 in the third, and $4.12 in the most remote band.

A corresponding map, based on Rural Electrification Administration figures, shows that rates for wholesale power supply to rural electric cooperatives rise progressively as the distance from TVA or Bonneville competition increases, with the average in the outermost zone from TVA more than three times those charged in the TVA market area and more than double those in the nearest zones to the south.

As a final illustration, I would call attention to the way in which an official plan for public competition supplemented regulation in New York, bringing about a reduction of rates in New York City which the public service commission of that State ordered but was restrained by the courts from enforcing. In 1933, the major company serving New York City was ordered to reduce rates by what was at that time the most effective regulatory body in the country. The company took the commission into the courts and early in 1935 won a decision reversing

the commission's order. But, within about 2 months, the company "voluntarily" reduced its rates. The explanation is that, while the case was pending in the courts, the mayor, Fiorello LaGuardia, supported by the Federal Administration in Washington, had come forward with a well-worked out plan to construct a 100,000-kilowatt municipal yardstick plant and had shown what such a plan could charge. It may be noted that within a year the company boasted that the rate reduction had proved good business.

Similarly, upstate New York private power companies during the same period reduced their almost prohibitive charges for rural electric service, maintained under regulation, when the farmers in Seneca County launched a drive to establish a rural electric cooperative to bring electricity to their farms at reasonable rates.

This committee is well aware of one outstanding evidence of the effectiveness of TVA public competition. I refer to the fact that groups of private companies found a new way of financing the Ohio Valley Generating Co. and Electric Energy, Inc., which made it possible for them to offer much lower rates than they would otherwise have offered for huge supplies of power for the Atomic Energy Commission.

Federal responsibility for competition: This brief review reveals the vital importance of keeping a vigorous portion of the Nation's power business in public or cooperative hands, that is, of assuring a continuance of the traditional American mixed system in this field. If this influence on the country's entire electric rate structure were to be undermined, it is safe to estimate that the cost to the Nation would be over a billion dollars in higher electric rates, with a resulting cramping of the growth of the national economy.

As I pointed out in my last year's statement to this committee, without Federal assistance, modern power supply technology would ultimately enable farflung private power systems to strangle existing public and cooperative systems, as well as to render new efforts to substitute public ownership practically impossible. In other words, beginning in the 1920's, small-scale local generating stations have become increasingly uneconomic as a source of power supply compared with great power supply networks linking together combinations of large generating plants.

Until the Federal Government entered the power supply picture, as a partner with local municipal and cooperative systems, this meant that such community systems became increasingly dependent for their power supply on their private competitors. The Federal Trade Commission investigation revealed the fact that private systems soon came to realize that charging high rates for power supply was an effective way to dampen competition.

This, in turn, means that if the people are to get the dividends on their great and continuing investment in atomic energy to which they are entitled, the Federal Government must undertake the responsibility of financing, constructing, and operating enough major atomic powerplants to meet the requirements of public and cooperative electric systems, and that the energy from these projects must be marketed in general accordance with the power policy which has governed Federal hydroelectric developments.

Atomic Energy Act goes part way toward Federal power policy: Certain of the principles of existing Federal power policy, which I

recommended to the committee last year, were incorporated in amendments to H. R. 8862, a bill to amend the Atomic Energy Act of 1946, and became part of the new Atomic Energy Act of 1954. Other essential principles of that policy were proposed as amendments but failed to get the approval of Congress.

The most important provisions of the Atomic Energy Act of 1954, conforming with Federal power policy, may be summarized briefly as follows:

(1) Inclusion of the preference to public bodies and cooperatives in connection with both the marketing of atomic power produced by the Atomic Energy Commission and the granting of applications for licenses to construct non-Federal atomic powerplants. These involved adoption of amendments to sections 44 and 182b of the bill. Although the AEC was limited to the marketing of power produced incidental to research and development activities and the production of atomic weapons, this reaffirmation of the preference principle prevented the new act from constituting a serious breach in the evolution of Federal power policy. Together with other provisions, it also opened the way under constructive administration to some real progress.

(2) Authorization and direction to the Atomic Energy Commission, either itself or through others, to conduct research and development activities relating to the generation of usable energy and for demonstration of the practical value of facilities for that purpose, including large-scale demonstration atomic powerplants. This provision involved some modification of sections 31 and 32 of the act. As I shall point out subsequently in more detail, this opens the way to Federal undertaking of large-scale Federal demonstration atomic development, in which a part of the demonstration would relate to the adaptability of atomic power to accomplishment of the purposes of Federal power policy. It also opens the way to Federal development of economically feasible smaller atomic generating units adaptable to the needs of small municipal systems and rural electric generation-transmission cooperatives.

(3) Specific provision that nothing in the act shall preclude Government agencies, now or hereafter authorized by law to engage in production, marketing, or distribution of electric energy, from obtaining licenses under section 103 for the construction and commercial operation of atomic powerplants. This was embodied in a new section 273. It opens the way for Congress to authorize a very considerable participation by the Federal Government in atomic power development under Federal power policy, where Federal agencies already have responsibilities in connection with power from river-basin programs. It also, in theory at least, recognizes that Congress may legitimately authorize other Federal agencies to undertake the supplying of atomic power in areas which lack hydroelectric resources and so have not had the direct benefit of Federal "yardstick" programs.

Omissions in the 1954 act which should be remedied: Important principles of Federal power policy, which were omitted from the Atomic Energy Act of 1954, fall into two broad categories: (a) failure to make provision in the new act for a program of Federal participation in the development of the country's new energy resource, along with licensed private development, as a legitimate part of the Nation's resources program, paralleling the water resources programs; and

(b) failure to make provision in the new act for extending to licensees for development of the people's atomic-power resources all the regulatory safeguards under the Federal Power Act which apply to licensees for development of hydroelectric power in rivers over which Congress has jurisdiction.

Further amendment to the Atomic Energy Act of 1954 to make good these serious deficiencies should include the following:

(1) Sections 1 and 2 of the act, containing the statement of findings and purpose, should be amended to make clear congressional recognition of development of electric power from the atom as one of the major objectives of the law. Such amendment should go further to express the public interest in electric power derived from this new resource and the intent of Congress to bring its development under traditional Federal power policy, including Federal participation, along with private enterprise, to the extent necessary to assure the people the maximum benefits.

(2) Section 25 of the act, providing for the Commission's administrative setup, should be amended to require the Commission to establish, among others, a Division of Civilian Power Application, correlative with the Division of Military Application. This would properly reflect the overwhelming importance to the country of electric power produced from the atom and would assure a part of the Commission's statutory organization charged with positive responsibility for the commercial development of atomic electric power by Federal, as well as non-Federal public and private agencies in the public interest. The substitute for this amendment, included in the final text of the act, falls short of meeting this requirement.

(3) A correlative amendment, to complete the statutory placing of responsibility for development of a sound atomic power program, would add a new section 28 establishing an Electric Power Liaison Committee, corresponding with the Military Liaison Committee established by section 27. Such a committee, composed of representatives of Federal agencies concerned with electric power, with an independent chairman appointed by the President, would advise the Atomic Energy Commission in connection with all activities directed at development of electricity from nuclear energy so as to assure its maximum contribution to the general welfare.

(4) The act should be further amended by adding a new section 45, empowering the Atomic Energy Commission, by itself or in cooperation with other Federal power agencies, to undertake Federal atomic power development projects, with the power marketed by the Secretary of the Interior in accord with section 5 of the Flood Control Act of 1944, governing the marketing of hydroelectric power from projects constructed and operated by the Corps of Engineers. This amendment was initially approved by the Senate but was defeated in the House and failed to survive the conference. The substitute changes in other sections of the act, while representing some improvement in the original draft, do not meet the need which I have outlined in my previous analysis.

This amendment would make it clear that the Federal Government itself, as well as other agencies, public and private, can generate and transmit atomic power. Through its provision for marketing the power under section 5 of the 1944 Flood Control Act, it would (*a*)

relieve the Atomic Energy Commission of a commercial function, (*b*) provide the standard preference basis for Federal partnership with public and cooperative electric systems, and (*c*) provide assurance of the transmission of such power to preference customers at reasonable cost.

(5) Section 103b of the act should be amended to establish as one of the conditions of licenses for development of atomic power that licensees may claim no value for licensed projects for rate-making purposes in excess of their actual net investment. This corresponds with the condition now applying to developers of water power under the Federal Power Act. It also embodies a sound principle of regulation which is doubly sound where private interests are granted the privilege of developing a publicly owned resource. It should be clear that, if the people choose to make the development themselves through a public or cooperative agency, they would never have to pay interest on more than the actual net investment in the project.

(6) Section 183 of the act should be amended to provide that every licensee for a utilization or production facility for the generation of commercial power under section 103 shall be subject to the regulatory provisions of the Federal Power Act applicable to licensees under sections 301, 302, 304, and 306 of that act and to such other provisions of the Federal Power Act as provide for the enforcement of the regulatory authority of the Federal Power Commission over licensees for the development of water power. This would simply place private electric utilities enjoying the privilege of using this great new public power resource under the same regulation as to accounting and related matters as licensees using the people's waterpower resources. An amendment to accomplish this purpose was introduced last year but a substitute was adopted which actually offers no additional protection to the public interest. Federal jurisdiction attaches to licensees because of the use of a Federal resource and not because of the usual factor of interstate commerce.

(7) Section 164 of the act should be amended by striking the language which authorizes the Atomic Energy Commission to become a broker for private power supply to the Tennessee Valley Authority up to an amount equivalent to the total present obligations of the TVA to supply power to the Atomic Energy Commission. This language was incorporated in the act by amendment ostensibly designed to give legal sanction to the so-called Dixon-Yates contract. But the ultimate effect would open the way to similar contracts to a total of perhaps five times the capacity covered by the Mississippi Valley Generating Co. contract.

These amendments are essential to assure progress in the development of atomic power under traditional American power policy. I shall reserve my remarks on the antimonopoly and patent provisions until after some further discussion of the situation requiring reconsideration of these provisions, particularly as they may affect progress in development of atomic power at low cost.

Need for prompt consideration of changes in the act: The importance of promptly incorporating these changes in the act is even more apparent today than it was a year ago.

This new urgency is apparent in the first place because, as shown on charts presented to this committee on February 28 by Mr. Clyde

T. Ellis, executive manager of the National Rural Electric Cooperative Association, the time is rapidly approaching when atomic power is destined to play an increasing role in providing the new generating capacity needed for the future expansion of our economy to assure full employment, higher standards of living, and more leisure.

In fact, as Mr. Ellis' testimony shows, well before the end of the century atomic power will be playing a far greater role than hydroelectric power in meeting the country's needs for low-cost electric energy.

Prompt action is called for also because the last 12 months has demonstrated that economically-feasible atomic power is not a remote but a present possibility once large enough plants are undertaken. The British 10-year program for building 12 large atomic powerplants as a part of its regular power supply program has already been referred to in these hearings. The New York Times London date-line story of February 15, 1955, refers to the expectation that within 10 years new nuclear power stations will constitute a fourth of the growth factor demanded annually and that within the following decade Britain may be building no new generating capacity other than nuclear.

British experimental work, done by the Atomic Energy Authority, the news story relates, has proved that the gas-cooled thermal reactor could produce electricity at a figure competitive with coal. A figure equivalent to 7 mills per kilowatt-hour is quoted.

This checks with the General Electric analysis presented by Mr. Francis K. McCune, general manager of the company's atomic products division, at the May 24, 1954, Atomic Industrial Forum panel in Washington, D. C. Mr. McCune's figures for two different types of reactor plant indicate that, with private financing, atomic power might be produced at 6.7 to 6.8 mills per kilowatt-hour if large enough stations are constructed. These General Electric figures, modified to reflect Federal financing, suggest the early possibility of a large Federal atomic powerplant producing electric energy at between 4 and 5 mills per kilowatt-hour.

But perhaps the greatest reason for prompt consideration of amendments which will bring the development of atomic power within the four walls of established Federal power policy, is suggested by Atomic Energy Commission testimony as to the status of its work on rules and regulations to govern the carrying out of the licensing provisions of the act. It appears that these rules and regulations are still in process of formulation by the Commission. Furthermore, according to General Manager Nichols, nobody is yet ready to apply for a license under section 103 of the act.

Nichols testified that the Commission expects to start off simply on a research and development basis. The Commission's statement of January 10, 1955, calling for proposals by April 1, is based on this approach. But, unless the act is promptly amended, there is serious danger that this approach will permit private development to get underway without the essential safeguards protecting the public interest in development of low-cost atomic power.

The very vagueness of the Commission's statement on its proposed regulations governing the exercise of its licensing function should cause the committee to stop, look, and listen. Amendment of the act to bring the licensing of atomic power development under the

same public interest safeguards as apply to licensees under the Federal Power Act would open the way to adapting the Federal Power Commission rules and regulations to cover licenses for development of atomic power.

One statement by General Manager Nichols, in his discussion of progress in the formulation of rules, seems of great importance. In fact, it contains a warning. He said:

> What we are doing today is setting off a whole new industry. We feel that if we make some basic fundamental errors in the beginning, we will be in serious trouble. So we are trying to do a good job on getting out the licensing procedure which is not too encumbered with red tape and yet protects and carries out the will of Congress which the 1954 act called for (hearings, p. 84).

I would respectfully urge upon the committee that, in setting off the new atomic power industry, which is really just the next step forward in the development of the electric power industry, a basic, fundamental error would be the failure to incorporate in the requirements and procedures, from the very start, the antimonopoly principles of Federal power policy. This would, indeed, surely lead to serious trouble in the future.

These principles, as applied to hydroelectric power, have been hewn out by careful congressional studies and action over half a century. There is no reason why the people should be asked to begin all over again with atomic power.

And let me add that the time to make sure that these aspects of the public interest are fully protected by the law is now, before the rules and regulations are formulated and licenses have been issued.

Representative HOLIFIELD. I would like to address a few questions to the witness on this particular section here, the last 3 or 4 paragraphs.

You have brought out very clearly here, Mr. Olds, about the length of time which it has taken the Commission to prepare these regulations on this new industry; you have brought out the fact that it is a new industry, that it is a power industry.

Would you feel that the Atomic Energy Commission, in view of its background of work in the production of atomic energy and application to the weapons field, would be qualified from the standpoint of experience to formulate rules and regulations for a power industry in the United States?

Mr. OLDS. I think, Mr. Holifield, that in order to do so, to be able to do so, it would be necessary for them to work in consultation with some kind of an advisory group representing the agencies which had had direct responsibility regarding power policy.

Representative HOLIFIELD. Is it not true that the Federal Power Commission is the recognized Federal body dealing with the subject with which they will have to deal? That is, the rates, the transmission of electricity, the costs of producing electricity, and all of that sort of thing, and the accountability of systems of cost accounting, and all that sort of thing.

Mr. OLDS. That is correct, and it is my recollection that the Federal Power Commission furnished some rather interesting statements in hearings on the bill last year indicating points at which the policy evolving in the bill left out of consideration important factors of protection for the public interest in the Federal Power Act. Of

course, that was carried out by the rules and regulations of the Commission.

Representative HOLIFIELD. It is true that the Commission has had experience in the fields of safety against radioactive hazards, and it is true that they have had experience in producing the fuel for this new industry, although they have not as yet proven to the satisfaction of many of us that they know what the cost of their fuel is that they have produced, because of the differences in their accounting practices.

Mr. OLDS. As I looked at it last year, it seemed to me that there were two aspects of the developing atomic power business. One was those aspects related to the general work that the Atomic Energy Commission has been engaged in, which relate to safety, health, and the national security. On the other hand was the broad field of power policy. The Federal Power Commission itself, in dealing with power developed in the river basins of the country, also has to deal with two broad fields. One field is the field that the Corps of Engineers is largely responsible for, including the use of rivers for navigation and flood control. The other is the field, again, of Federal power policy.

In the working out of all of the licensing functions by the Federal Power Commission, it is constantly and by law must be consulting with the Corps of Engineers in determining whether proposed licenses fit in with the other uses of the river for which the Corps of Engineers is responsible.

It seems to me that in dealing with the evolution of the licensing function in connection with atomic energy, the matter could be handled in the same way, and the Atomic Energy Commission could be responsible for those phases of the rules and regulations, and their application, which are directly related to its particular functions and what it must safeguard; but that it could work with a Federal power agency—we will say the Federal Power Commission—on those elements which are directly related to policy questions of Federal power.

Senator HICKENLOOPER. Will the gentleman yield?

Do I understand that the impression is being created that the Atomic Energy Commission is licensing and supervising the production and distributon of electricity? I know of nothing in the act which connotes that. I think they only license the use of fissionable or special materials, because of the national defense situation, and that they do not pretend to say what the people will do with the electricity; that if it is interstate it will be controlled by the Federal Power Commission, and if it is intrastate it will be controlled by the State regulatory body.

Mr. OLDS. Actually, under the 1954 Atomic Energy Act, under section 103, the Atomic Energy Commission is responsible for the licensing of, among others, corporations and other non-Federal agencies which will develop power, and authorizes the development of power from nuclear energy.

Senator HICKENLOOPER. I am sorry, Mr. Holifield, but I just want to ask, will you not agree that that licensing, by any reading of it, is not to license them to produce power; it is licensing them to use nuclear materials. And the only reason for that license—or there may be two reasons. One is the need potentially in national defense, and we must keep control of it, and therefore it must be licensed; and, secondly, there is a danger element involved in these particular things. It does not go at all to the development of electricity, as such.

Mr. OLDS. If that is a correct interpretation of the law, then what I am urging is that there is a need, a pressing need, for association, in the licensing of the use of this fissionable material, with, you might say, the Federal Power Commission.

Senator HICKENLOOPER. I understand what you mean now, and I do not want to longer trespass on the gentleman's time. I just wanted to clear it up as to what we are talking about.

Representative HOLIFIELD. Of course, I did not mean to indicate by my line of questioning that they were going to be engaged, under the law as it is now written, in the commercial production of power, as such. But I did mean to convey or draw the witness out on certain points as to the qualifications of this body to set up rules and regulations and power policy; and they must set that up by the very fact of determining who shall have these licenses and where these reactors are established, whether they are in low-cost areas or high-cost areas, and whether they are in hydroelectric areas or desert areas. And by virtue of the fact that they have been given the administrative task of granting licenses, they must inevitably affect the power policy of the nation.

Mr. OLDS. In effect, what the law has given the AEC authority to do is to grant, among others, to agencies, non-Federal agencies, the privilege of using a publicly owned resource for the production of power. As far as the act stands today, that precise thing is nobody else's responsibility. It is not the responsibility of any State agency. That is a grant of a privilege, and attached to that grant of privilege there ought to be Federal law and Federal regulations protecting the public interest in the use of that resource for the purpose for which it will be used.

Representative HOLIFIELD. And there is the same basis of reasoning as to why the Federal Power Commission law was passed for the preservation of another resource for the people's benefit.

Representative COLE. I should like to observe that, in my interpretation, section 103 does not authorize the Atomic Energy Commission to exercise any discretion whatever in determining the location of a reactor and in determining the individual operator or licensee except with respect to his qualifications otherwise. The Commission is required to grant licenses under section 103 without discrimination.

Mr. OLDS. I recognize that. I am dealing solely with the fact that they are authorized to grant licenses for the use of a resource to produce power, and I am not saying it has to do with where the power shall be located, but it does enter into the whole public interest aspect of the thing.

Representative HOLIFIELD. The granting of each license must inevitably determine the location of the use of that resource.

Mr. OLDS. That is correct.

Representative HOLIFIELD. You cannot grant a license without taking into consideration whether it shall be in Pittsburgh, for instance, or whether it should be in the Tennessee Valley, or whether it should be in Las Vegas. All things being equal, other qualifications of applicants being equal, there still remains a determination as to location of the reactor, inevitably.

Mr. OLDS. If there ever came a time when there was a limitation on the availability of the resource to meet all of the requirements of all of the applicants for licenses, then I assume that the judgment of the AEC would have to govern the selection.

I will now proceed.

Who is providing the risk capital? The testimony which has already been presented to the committee raises a serious question whether the speeding up of the progress toward economically feasible atomic power, which the people were led to expect would result from opening the field to private enterprise, has actually been realized. It raises the correlative question whether the further large investment by the people themselves, which is apparently required, would not get better results if expended along the lines of an unashamed public program as it is in England.

In other words, most of the testimony reflects the unreadiness of private enterprise to go forward on anything except a very modest research and demonstration basis, while expecting the Government, through the Atomic Energy Commission, to put up the greater part of the risk capital. The only hopeful rift in these clouds of hesitancy appears in the plan of Consolidated Edison Co. of New York, and that is not yet sufficiently set forth to enable us to judge how it will be developed.

The extent to which the Government is assuming the developmental role normally associated with private enterpise is reflected in the testimony of Commissioner Libby. He said:

> The AEC's power technology program is based on the premise that it is the Government's responsibility to advance the frontiers of knowledge in the field of reactor development. It is expected that the industrial organizations will gradually pick up the advanced technology of earlier periods and carry it into end products on a risk capital basis (hearing, p. 89).

General Nichols reiterated their anticipation that the companies would go forward on a research and development basis rather than under section 103 licenses. At one time he testified that in their talks to various companies—

> none of them felt that the state of the art was yet ready where they could completely finance a research and development reactor of any reasonable size (hearings, p. 157).

There is every evidence that the main progress is expected to come form the AEC's own reactor program which it is projecting on the basis of an estimated expenditure of $200 million over the years 1954–58.

The contrasting attitude of private enterprise is nowhere more clearly reflected than in the testimony of Walker L. Cisler, who appeared as spokesman and Chairman of the Management Committee of Atomic Power Development Associates.

Cisler testified that his group represents 33 companies and, from the representatives he introduced, it appears that they are among the important companies of the industry. So it is interesting to learn from his lips that, as a result of enactment of the Atomic Energy Act of 1954, this important group has stepped up its annual budget for research and development from $2,800,000 in 1954 to $3,815,000 in 1955 (hearings, p. 227).

Cisler suggested that this represents industry's response to the new law. He did add that, since the Commission's January 10 call for proposals, the group had begun making plans for a large breeder reactor capable of producing up to 100,000 kilowatts of electricity at a cost of $50 million or more. But his testimony indicated that this step is still problematical, so that the figure for the group is still under $4 million. Speaking for his own company, the Detroit Edison, Cisler said that its budget for this work had been raised from a half million to three-quarters of a million dollars.

When one takes into account the fact that the electric power utilities represent net assets of about $20 billion, with over $2 billion in accumulated surplus profits, the amount they are avowedly risking on atomic power development seems relatively insignificant. And then, suddenly, we come on testimony which raises the question of whose money are they really risking. For, in response to questions, Cisler testified that under a ruling from the Michigan Public Service Commission they are charging these developmental expenditures to operating expenses, which means that the expenditures are payable either by ratepayers or the country's taxpayers.

This suggests that the procedure which, during the so-called developmental period, would use section 104 rather than section 103 of the act as the basis for proposals of private enterprise, is not actually designed to allow the companies to go through the motions of providing private risk capital while actually drawing most of their funds for this purpose from tax savings and rates. For, if I understand correctly, such developmental expenditures are chargeable to expenses and, hence, deductible for income tax purposes. This loophole approach may be even more satisfactory than the fact amortization tax saving approach because, under the latter, the taxes ultimately have to be paid, although providing free capital in the meantime.

In addition, as testified to by Nichols, as long as they go forward under section 104, there are possible subsidies, including fissionable material, for the research and development period provided without interest, performance by the Government of research and development work for the companies, and possibly research and development grants "with the idea that we would get their results and make it available to all" (hearings, p. 86).

Coupled with Cisler's reiteration that the Government must be in a position to carry forward the research and development work in the National Laboratories (hearings, p. 248) and that the companies could not carry out the accomplishment of the breeder reactor without the cooperation and assistance of the Government (hearings, p. 251), the above-noted facts suggest that, in spite of the new act, the greater part of the risk capital is being furnished by the Government and the customers of the companies.

Finally, there is a further statement by Cisler, which may cast an important light on the program announced on January 10 by the Atomic Energy Commission. For it raises the question whether big private monopolies in the field of electric power are not more interested in keeping the program in their own hands than in rapid progress toward economically feasible atomic power at this time. In response to a question from Senator Pastore as to whether he thought the Government and industry were doing all that was necessary to advance the atomic power program, Cisler said:

I believe we are doing everything reasonable. If we were to go to a crash program, what would be the justification from an economic standpoint? We have sufficient electric power in this country. In fact, we have more than 40 percent of the total electric power in the world (hearings, p. 254).

This answer reflects very precisely the shortsighted attitude of monopoly. It is strangely reminiscent of the attitude taken by private power companies toward the efforts, before Pearl Harbor, to assure sufficient orders for additional generating capacity to meet the needs of the country's defense program. In 1939, as a result of urging by the National Defense Power Committee, the spokesman for the private power companies pledged that the industry would order an additional million kilowatts of capacity to meet the situation. Two years later, after private and public utilities, plus industrial establishments, had added a combined 3,000,000 kilowatts, the president of Edison Electric Institute was saying that no more power would be needed.

Actually, the record shows that over 11 million additional kilowatts of capacity was required during the year 1940–44, inclusive, to meet minimum civilian requirements and provide for successful conclusion of World War II. Of this, over 9 million kilowatts was provided by private and public utility systems. It is interesting to note, however, that, with about 87 percent of total utility capacity in 1939, the privately owned portion of the industry provided only 58 percent of the additional utility capacity. Public power provided the remainder.

Recommended program changes to assure progress: The light which the testimony I have just analyzed throws on the demonstration power reactor program set forth in AEC announcement No. 589 of January 10, 1955, suggests the need for fuller investigation looking to a broadening of the program with a view to eliminating the influence of private monopoly. The country cannot afford to have this vastly important step forward in the electric power field delivered lock, stock, and barrel into the hands of great corporations whose inside track in the field will assure them ultimate control over this essential element in our economy.

I shall have more to say about the general threat of monopoly under the program which is developing under the Atomic Energy Act as it stands today. But first I want to offer two recommendations for changes in the program which I feel would go far to thwart the monopolistic trend. They are thoroughly in accord with the traditional American power policy which I have been discussing.

I would respectfully recommend that, either under broader authorization for Federal participation in the development of atomic power through amendment of the act or, until such amendment is adopted, through Federal construction of demonstration projects, a Federal yardstick atomic power program be undertaken, to include:

(1) Federal construction of a number of full-scale (200,000 kilowatts and up) atomic powerplants, located with particular reference to the needs of the Atomic Energy Commission itself and the power supply requirements of public and cooperative electric systems which are entitled to a preference under the existing act. The Atomic Energy Commission is already authorized to build large-scale demonstration projects, but Congress should provide specific authorizations and appropriations for their undertaking.

Senator GORE. May I ask a question there. Is there in existence authorization for the making of an appropriation for this purpose?

Mr. OLDS. It is my understanding that the act is broad enough so that if it is done under the large-scale demonstration and research program, there is such authorization available.

Senator GORE. There are two sections of the act——

Represenative COLE. I wish to clarify that. You are only partly correct, in that, even for the purpose which you indicated, a large reactor facility would still require special authorization for the appropriation of money.

Senator GORE. They have authorization on the one hand, but on the other hand we took it away from them. It would require additional legislation.

Mr. OLDS. I have suggested that in my statement—to provide such specific authorization and appropriations for that undertaking.

Senator GORE. I wished to point out to you that your language there is a bit misleading. Actually, there is no authorization for an appropriation for this purpose, as of now.

Mr. OLDS. No. But there is authorization for the Commission to undertake such projects in general, for demonstration on a large scale.

Senator GORE. The Commission cannot undertake it unless Congress appropriates money for it; and Congress is without the authority to appropriate the money for it unless there is congressional authorization for it. Where are we? The first authorization might as well not be in the bill.

Mr. OLDS. I agree that a further authorization is necessary, and I tried to so state in my statement there.

(2) An all-out federally supported program for development of economically feasible small atomic powerplants, adapted to meeting the needs of small municipal or rural electric systems, either integrated with Federal power supply from larger hydroelectric or atomic power stations or on an isolated basis. This program can be carried out as a part of the larger AEC research and demonstration program, but should be developed with the full cooperation of the Rural Electrification Administration, the National Rural Electric Cooperative Association, and the American Public Power Association. The results might also prove of great value in connection with the Nation's foreign-aid program. Such a technical mobilization should consider the possibilities of ultimate transformation of nuclear energy into electric energy without the intervention of steam.

In this connection it should be noted that the requirements for security clearance for those seeking participation in the atomic power program contributes in a major way to strengthening the preferred position of those corporations which have all along been contractors with the AEC. I am happy to see that the Commission is somewhat relaxing these requirements in connection with limited participation of outsiders in the program.

But I would recommend that the public interest in this new field of electric power development would be greatly severed by a more general relaxation of the secrecy which has been maintained to date in that part of the Commission's work involving ultimate development of commercial power.

Records of AEC contractors reveal need for antimonopoly safeguards: The history of a number of important firms with which the

Atomic Energy Commission does business affords little assurance that the American people will get early, abundant benefits from their atomic investment if commercial applications are channeled through them. This will be particularly true if they are allowed to take out the normal, exclusive monopoly-type patents on processes which grow out of their years of exclusive, advance, and secret knowledge of the art.

This conclusion is drawn from a cursory investigation of the background of AEC contractors which shows that a considerable number of them have been indicted for violation of the antitrust laws and fined or bound by consent decrees to desist from their unlawful practices.

Some of the biggest have been involved repeatedly. The complaints and indictments have charged controlling patents and suppressing products and processes; making international arrangements to keep an abundance of desirable products from the American people; limiting production, controlling distribution, and otherwise conspiring to maintain scarcities and keep prices high.

The E. I du Pont de Nemours Co. operates the $1.5 billion Savannah River plant of the Atomic Energy Commission near Aiken, S. C. It designed, engineered, built and operated the big Hanford, Wash., plant of the AEC. It has been on the inside of atomic secrets or know-how from the very beginning of its development for military uses.

Yet this company has one of the most extensive records of indictment for violation of our antitrust laws of any firm in the country. The Bluebook of Federal Antitrust Laws, with a summary of cases instituted by the United States from 1890 to 1951, lists 10 cases in which this company was the principal defendant.

The first antitrust action filed against this firm was almost a half century ago, on July 30, 1907, in civil courts under the Sherman Act. It alleged that Du Pont and several powder manufacturers had acquired a virtual monopoly and sale of gunpowder and explosives by acquiring the stock of, and in some cases dissolving, competing corporations. The combination was declared illegal in 1911 and its dissolution ordered (Bluebook, p. 51).

E. I. du Pont de Nemours Co. was indicted under section 1 of the Sherman Act in the Southern District of New York, September 1, 1939, with three other corporations on a charge of conspiracy and combination to restrain interstate trade and commerce in synthetic ammonia solutions used in preparing commercial mixed fertilizers.

The indictment charged the defendants fixed uniform prices and terms, based upon units of synthetic ammonia and nitrogen, and that they cut prices to discourage potential competition, obtained exclusive sales agency agreements from small-volume producers, and purchased synthetic ammonia solutions from other small-volume producers at arbitrary prices to discourage plant expansion.

Trial of this case was delayed until May 29, 1941, when the Government filed a civil suit against Allied Chemical & Dye Corp., three of its subsidiaries and the Du Pont Co., charging them with a conspiracy "to monopolize and a monopolization of interstate and foreign commerce in fertilizer nitrogen and commerce in Puerto Rico, Hawaii, and the Philippine Islands and between them and the United States and foreign nations."

The complaint alleged that the defendants combined to control the quantity of each type of fertilizer nitrogen imported into and exported from the United States and its territories, and its sale at noncompetitive prices through the exchange of statistical and other information; and that international cartel agreements were entered into providing for restrictions as to quantities, prices, and destination of fertilizer nitrogen imported into and exported from the United States.

On the same day this suit was filed, a consent decree was entered enjoining the alleged conspiracy and 4 days later the 1939 indictment against Du Pont was dismissed in view of the consent decree in the civil case (Bluebook, pp. 458, 613).

On June 4, 1942, E. I. du Pont de Nemours Co. was indicted with 5 other corporations and 10 individuals for a conspiracy to restrain interstate commerce by fixing the prices and terms of sale of commercial explosives and blasting supplies.

I go into the detail of the allegations made in these cases because they are pertinent to the public's prospect of getting speedy peacetime benefits of the atom unless the law and AEC procedure are tightened to preclude similar practices in the development of the new industry.

The 1942 indictment charged Du Pont and the others maintained identical quantity brackets for price differentials; sold at delivered prices only; divided the country into zones and sold at identical prices within each zone without regard to difference in freight cost; induced their jobbers to maintain idential resale prices and refrained from selling to each other's key jobbers. All defendants plead nolo contendere and were fined a total of $33,000 (Bluebook, p. 712).

E. I. du Pont de Nemours Co. was indicted with 2 other chemical companies and 11 individuals on June 26, 1942, in the Northern District of Indiana, charged with conspiracy to restrain interstate commerce in chromic acid. All four corporations pleaded nolo contendere in 1945 and were fined $20,000 (Bluebook, p. 718).

Another indictment against Du Pont, another producer and three distributor corporations, charged conspiracy to restrain and monopolize interstate commerce in formic acid, alleging price fixing and control of the channels and methods of distribution. The case ended in pleas of nolo contendere and fines for the corporations (Bluebook, p. 720).

The E. I. du Pont de Nemours Co. was also indicted June 26, 1952, in the Northern Indiana District for conspiracy to restrain interstate commerce in muriatic acid. The indictment charged the defendants with fixing prices, entering into exchange agreements, purchasing from each other for resale and using reciprocal relations and price discriminations as a means of controlling sales. Four corporate defendants pleaded nolo contendere and were fined $20,000 in 1945 (Bluebook, p. 721).

On July 20, 1948, indictment was brought against Du Pont and 7 other corporations and 8 individuals charging them with conspiracy to restrain interstate commerce by price fixing in the wood finishes industry.

The indictment charged that each of the defendants by concert of action combined and conspired to fix and maintain uniform price levels by means of noncompetitive discounts, published schedules of prices and exchange of information on lacquers, varnishes, enamels

and stains. Seven of the corporate defendants entered pleas of nolo contendere and were fined $42,000 (Bluebook, p. 932).

This case, together with a cellophane cap and band case (Bluebook, p. 911) and the 1949 case against Du Pont, General Motors and others, charging monopoly control over chemicals, paints, autos and parts, refrigerants, tires and tubes, artificial leather, celluloid, patents and explosives (Bluebook, p. 987) were still pending when the Bluebook was published by the Commerce Clearing House in 1952. The latter case was recently involved in the news when the Attorney General indicated that he would appeal dismissal of the indictment by the district court.

I shall not take time to go into similar detail in connection with the antitrust records of other AEC contractors, but will summarize one or two of them of particular significance in connection with the power industry.

The Commerce Clearing House Bluebook shows General Electric, which is a major AEC contractor now operating the billion dollar Hanford plants, has been principal defendant in 11 of the major antitrust cases. A petition was filed in the northern district of Ohio in March 1911, charging that this company and numerous of its subsidiaries had combined and conspired to fix prices, eliminate competition and restrain trade in old-fashioned incandescent electric lamps by concealed stock ownership of bogus independent companies and by the use of tying agreements. In October of the same year the court enjoined the illegal practices and ordered dissolution of the bogus independent companies (Bluebook, p. 82).

In January 1941, complaint was again filed against General Electric together with Westinghouse Electric Co. (another AEC contractor), 9 other American corporations and 1 Dutch company, charging them with conspiracy to restrain trade in incandescent electric lamps, glass bulbs, tubing, cane, argon gas and the machinery for the manufacture of these items and other chemical equipment (Bluebook, p. 575).

Westinghouse signed a consent decree agreeing to free public licensing of all present and future patents relating to lamps, lamp parts, and lamp machinery, and enjoining it from entering into any contracts as to price, territories, and quotas.

Corning Glass Works joined in a consent decree requiring it to license all its existing patents royalty free and all future patents at reasonable royalties, requiring it to show other companies how to use the patents at a reasonable fee, and requiring it to sell bulbs, tubing and cane at nondiscriminatory prices to every purchaser.

On January 29, 1949, the court held that General Electric had monopolized the incandescent lamp industry, had established and maintained a number of supporting monopolies embracing patents, lamp bases, and glass parts used in the manufacture of incandescent lamps, and with its licensees had conspired to restrain trade and commerce.

The Bluebook reports:

Lifting the corporate veil of International General Electric, the court said, it was exposed as a facile tool and active conspirator in a scheme whose primary purpose was the maintenance of General Electric domination over the lamp industry in the United States by preventing foreign competition.

Despite its experience in these cases involving the old-fashioned incandescent electric light, General Electric, Corning and 5 other manufacturers, including 1 in Holland, were charged with conspiracy to restrain and monopolize interstate and foreign commerce in fluorescent electric lamps (Bluebook, p. 747).

This complaint alleged, among many other things, that the defendants had a monopoly on patents relating to flourescent lamps and had agreed with public utility companies not to promote or advertise these lamps, which consumed less electricity than the old-fashioned incandescent type.

Trial of this case was set aside during the war at the request of the War Department. The Bluebook records that in March 1946, a consent decree was entered requiring Corning Glass Works to license royalty free under its existing patents, to license at reasonable royalties all future patents applied for before 1950, and to furnish at nominal charge technical information on glass formulas which it was then using. The company was enjoined from price fixing and other illegal practices.

General Electric had also been previously indicted with two other American corporations and a German corporation, in October 1941, for conspiring to monopolize interstate and foreign commerce in patented and unpatented hard-metal alloys and tools and dies made therefrom, principally tungsten carbide. The defendants pleaded not guilty. After a wartime delay, the case was tried and all American defendants found guilty on all counts, and fined a total of $56,000 (Bluebook, p. 650).

This is only a part of the General Electric story. But it recalls the story of how the Swedish consumer cooperatives tackled International General Electric more than 20 years ago when research by the Cooperative Wholesale Society indicated that the price of electric-light bulbs was at least 12 cents too high.

This story suggests that public or cooperative competition may prove a sound way of dealing with electric equipment companies, as well as with electric utility companies which use their monopolistic position to maintain high rates and limit consumption.

When the international trust refused to lower the price as requested by the whole society, the latter proceeded to erect a modern and efficient light-bulb factory. Five Scandinavian cooperative wholesale societies met frequently for consultation while it was being built and it started production as the North European Luma Cooperative Society.

The success of this undertaking was immediate and far-reaching. Even before the factory was completed, price of lamp bulbs in Sweden had dropped from 37 cents to 27 cents. Luma was able to price its lamp at 22 cents, and the trust was compelled to meet that price.

When the President's inquiry on cooperative enterprise in Europe reported in 1937, the cooperative plant was supplying only about one-third of the electric-light bulbs in Sweden but that element of competition was enough to curb monopolistic prices.

Turning back to the Bluebook, we find that the other notable instances of AEC contractors with antitrust records include National Lead Co., Union Carbide & Carbon Co., Dow Chemical Co., Proctor & Gamble, and American Cyanimide Co.

In fact, the record shows that at least 9 out of 10 of the private operator-contractors, listed in the Atomic Energy Commission's Uranium, Plutonium, and Industry booklet, have such records.

In the debate over the Atomic Energy Act of 1954, proponents of the bill emphasized the importance of harnessing the genius of American private business to the development of peacetime, commercial uses of the atom. In this way, they said, the public would get earliest possible benefits from its $12 billion investment in the field.

But the strict secrecy regulations, which are still maintained, and the limitation of atomic know-how to a relatively few big firms—many of them repeatedly in the courts for using patents and other devices to restrain trade—give little hope that the public will get the benefits from the commercial use of the atom to which it is entitled. In fact, the entire situation raises the question whether, without change in the Commission's present program, the rate of discovery and development of atomic processes will be speeded or retarded.

Are these big concerns the real inventors and discoverers? The pattern of conduct of many of the firms which have the advance know-how on atomic processes thus indicates that they will be likely to use their patents and their enormous resources to control nuclear processes to their own advantage rather than for the benefit of the public. But there is actually serious question if this group are the real inventors and discoverers who have made American ingenuity famous, or are simply believed to be because they can spend millions on publicity and public relations.

T. K. Quinn, a former vice president of General Electric, who was in line to head that huge corporation, quit the company, instead, because he was concerned about the shortcomings and dangers of bigness in American business.

Mr. Quinn subsequently wrote the book Giant Business, Threat to Democracy. In his book Mr. Quinn expressed the view that—

> a large number of individuals working without restrictions is better for the country and the future than a few large organizations, however well publicized and formidable their appearance.

He goes on:

> The prospects of invention are infinitely better * * *. Rather than 10 big research laboratories, each spending $10 million annually * * * for example, we would do much better as a Nation to have a thousand smaller groups working and thinking for the future.

Quinn says that he knows of no original product invention—I assume he is speaking of the field which he is familiar with—not even electric shavers or heating pads, made by any of the giant laboratories or corporations. He notes the household garbage grinder as a possible exception.

He says that this was developed by the engineering department rather than the research laboratory of General Electric, but adds that the basic idea came from a smaller concern. According to this former General Electric executive:

> The electric range was invented and developed by Mr. George Hughes of Chicago. He and his Hotpoint Co. were taken over by General Electric.

Even the electric incandescent lamp, according to Quinn, was no exception. It was invented by Thomas Edison, who was absorbed with his Edison Co. by General Electric. Quinn notes, however, that

Edison "later dissociated himself" from the big company "to go on with other major inventions."

We have already noted that General Electric, after acquiring the incandescent lamp, entered into a conspiracy to monopolize it, restrain trade and give the appearance of competition by maintenance of bogus independent companies in which GE secretly held the stock.

Quinn goes on to list electric refrigerators, electric dryers, the hermetically sealed compressor now used in practically all household refrigerators, vacuum cleaners, clothes-washing machines, deep freezers, electric irons, automatic electric toasters and electric clocks, all as electric appliances developed by relatively unknown small corporations and ultimately absorbed by the giants. He asks:

> Where will future inventions and developments come from if the smaller companies continue to be discouraged and crowded out of existence by the giants?

These observations of a man who started at the bottom and worked himself to the top of the giant General Electric Co., now one of the very few huge corporations with long experience in the secret atomic field, make it doubly questionable if the people of this Nation, with billions of dollars invested in the basic atomic arts, are to get the real benefits of the atom unless there are major changes in the policy established by the Atomic Energy Act of 1954 as administered by the AEC.

In connection with any review of the licensing and patent provisions of the Atomic Energy Act, and any review of the secrecy provisions and regulations which hold small business out of the atomic field, it is obviously highly desirable to make an intensive study of the business record of the corporations which are now doing business with the Atomic Energy Commission and have a head start in the field, their antitrust records, their business practices as measured against our national antimonopoly policy and their past misuse of patents for monopoly purposes.

We are in a situation in which opening the doors to commercial development of the atom without proper regulation could result in actually giving the control of American business life in the nuclear era to a few monopoly-minded corporate giants, paralyzing rather than speeding discovery and development, and changing the character of our whole business structure.

Strengthening of antimonopoly provisions needed: I have not referred to the records in these antitrust cases to single out specific companies for blame but to call attention to practices which are apparently characteristic of the big corporation trend in this country and which Congress must face squarely if the people are to get the full benefits from their atomic resources.

What happened to the electric light bulb and, for that matter, what happened to the electricity which lighted these bulbs where monopoly was unchallenged by competition, must not be allowed to happen in connection with the country's atomic program.

And it must be apparent to everyone that the regular provisions of the patent laws and the antitrust laws are not adequate to protect the public interest in this new field.

This is true even if we assume that all American enterprise has an equal opportunity to start from scratch in this new industry, without an inside track for those already participating in the development of the new technology. For there is nothing to prevent hopeful small

participants, who develop new inventions in the field, from being gobbled up by the larger combines along the lines described by former GE executive Quinn.

Apparently the small fines following indictments for antitrust law violations serve as no deterrent to multimillion dollar corporations.

In terms of the development of atomic power as the next big step in the progress of the electric power age, I have suggested that the answer to the Nation's need for abundance of low-cost power is a program which will continue to maintain the vitality of our traditional system of mixed enterprise in this field.

This, as I suggested, requires sufficient Federal participation in the development of atomic power to assure communities choosing public or cooperative electric service their necessary share of the new supplies of low-cost energy.

As for the nonutility portion of the new atomic age, the answer should certainly be a strengthening of the antimonopoly provisions of the Atomic Energy Act along the lines of amendments offered last year but watered down or rejected.

It should further include modification of the patent provisions of the act to require compulsory licensing of patents at reasonable charges, not for 5 or 10 years, but for the indefinite future, in order to assure private competition.

But it should also not overlook the significance of the Luma example in Sweden, where the great international electric trust is being curbed by a kind of competition which it can neither buy up nor involve in cartel agreements because it is controlled by consumers. Either through cooperative or public competition their appears to be a way of dealing with monopoly which is proof against the weaknesses of fines and consent decrees. This avenue warrants full exploration in connection with the Nation's peacetime atomic policy.

In connection with its great responsibility for the sound entrance of this country into the age of atomic power, this able committee should consider all approaches to preserving its values for the people. For these values, if preserved, will appear as dividends expressed in economic expansion, full employment of a rapidly growing population, shorter working hours and high standards of living.

Representative DURHAM. Thank you very much, Mr. Olds. You have made an excellent statement and the committee appreciates your coming here and giving us your opinions and thoughts.

Are there any questions from any members of the committee?

Thank you very much, Mr. Olds, for coming down.

Representative COLE. Mr. Chairman, 2 or 3 days ago at our recent hearings, reference was made by the witnesses to the code adopted by New York State with respect to atomic irradiation, sanitation, and so forth.

I have a copy of it here now, and I would ask that it be included in the record, in the appendix of these hearings.

Representative DURHAM. Thank you very much. I think it is an excellent thing for the record. I have read it myself.

Without objection, it will be included in the appendix of the record.

The committee will adjourn.

(The information referred to appears in the appendix, p. 613.)

(Whereupon, at 3:25 p. m., Wednesday, March 2, 1955, the committee adjourned to reconvene Thursday, March 3, 1955, at 2 p. m.)

DEVELOPMENT, GROWTH, AND STATE OF THE ATOMIC ENERGY INDUSTRY

THURSDAY, MARCH 3, 1955

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The Joint Committee met at 2:10 p. m., pursuant to recess, in room P–63, the Capitol, Senator Clinton P. Anderson (chairman of the Joint Committee) presiding.

Present: Senators Anderson, Pastore, Hickenlooper, Gore, and Bricker; and Representatives Durham, Holifield, Cole, and Price.

Present also: Corbin C. Allardice, executive director, George Norris, Jr., counsel to the Joint Committee, and Walter A. Hamilton, of the professional staff of the Joint Committee.

Chairman ANDERSON. The witness is here and 2 or 3 of us are assembled. I think we can go ahead with Mr. McCune.

Mr. McCune, we are very happy to have you here. I know the company you represent and you personally are interested in this problem. It is a pleasure to have you come here.

STATEMENT OF FRANCIS K. McCUNE, VICE PRESIDENT, GENERAL ELECTRIC CO.

Mr. McCUNE. Thank, you Senator.

I have a prepared statement which I should like to present, if I may.

Chairman ANDERSON. I think we should have it all.

Mr. McCUNE. My name is Francis K. McCune. I am vice president and general manager of General Electric's atomic products division. I have with me William F. Kennedy, who is my counsel.

We appreciate this opportunity to present our views in connection with this committee's inquiry into the state of the atomic-energy business.

We feel very strongly that industry should not simply play a passive part. American business must actively assist in the development of its own role and responsibilities in the new atomic-energy industry. For this reason we have felt a strong obligation, as a good corporate citizen, to participate in the hearings of your committee.

I would like here to make one initial point. The basic question now before this committee is, as I see it, how much can, and will, private enterprise accomplish in a field where a decision has been made that either Government or industry must achieve success? Let us then look at the record of private enterprise.

Atomic energy antedates—by far—the Government effort. The Manhattan Engineer District and the Atomic Energy Commission

have been means of harnessing for the public large segments of privately developed know-how.

In our case, for example, I know that we were busily engaged in the atomic-energy field over 20 years ago. We worked for the Manhattan Engineer District, we have been a contractor of the Atomic Energy Commission from the very beginning, and we are now very actively involved in developing peacetime uses of atomic energy. Throughout all of this period, our incentive has been the firm and unwavering belief that American industry should, could, and would make a major contribution to the public welfare through research, development, and production in this new field.

As one of the first companies in the atomic field we have come to appreciate the invaluable role that is played by your committee. The future of the atomic-energy industry is affected by a large number of imponderables and uncertainties. Many of the forces which will shape the course of the future are of a magnitude beyond the control of any of the companies engaged in the atomic business. Confronted with these uncertainties, it is reassuring to know that a permanent legislative body of the high caliber of the joint committee is fully conversant, and actively concerned, with atomic problems. It is encouraging to us that the group responsible for atomic legislation is so receptive to the views of those affected by its actions.

Anyone who has made a serious study of the atomic-energy industry has had to accept one incontrobertible fact: The development of atomic energy must be carried on through the active cooperation of the Government and of business. Under the 1954 act it is unrealistic to think in terms of complete free enterprise. It is equally undesirable—as the 1954 act has recognized—to proceed within the framework of a Government monopoly. Industry must recognize the indispensable role of the Government and the Government must recognize the equally essential, independent yet cooperative, role which industry must play. Under the new act industry is expected to play an increasingly active, independent role in atomic developments, employing its own resources and making its own plans. Yet under the new act entry into the industry requires Government approval; knowledge of essential operating information requires security clearances, which are difficult to obtain; special nuclear material can be obtained only from the Government, and can be disposed of only to the Government, both at prices fixed by the Government.

I am under no illusion that the successful operation of the "mixed economy" envisaged by the 1954 act can be easily achieved. Quite the reverse. It will not be an easy job, for it is not a familiar one. To make a success out of such a unique economic relationship will require a vast amount of intelligence, patience and good will on the part of everyone concerned. We at General Electric will do our best to make it work.

As you well recognize, the passage of the 1954 act was simply one step—though a very important one—in the development of an operating framework within which Government and industry can work together effectively. The Commission's regulations must fill in the general outlines provided by the act. Even after the regulations have been issued, the job will not be complete. In a new and rapidly developing field, the framework of the operating relationship can never

be static. It must be sufficiently flexible to take account of accumulating experience and changing conditions. Yet at the same time, the framework must be sufficiently clear and specific so that conflicts based on uncertainties and misunderstandings will be kept to a minimum. This is a job which can never be completed in any final sense. There must be a continuing reexamination and redefinition of the relative roles and responsibilities of Government and business.

This job of reexamination and redefinition must go on at several different levels. That there is a continuing legislative role is recognized in the act itself. There is the general requirement that "the Joint Committee shall make continuing studies of the activities of the Atomic Energy Commission and of problems relating to the development, use, and control of atomic energy." In addition there is the specific injunction that hearings—of which the present are the first—shall be held during the first 60 days of each session of Congress.

The Atomic Energy Commission now has a new role as a regulating agency. In this role it is under a continuing obligation to keep its administrative regulations both specific and flexible enough to assure maximum progress. It is very important that the Commission recognize the responsibilities which flow from its unfamiliar new role as a public regulatory agency. Its actions will affect the activities of a whole industry. For that reason all segments of the new industry must be kept fully informed of all regulatory actions of the Commission. Not merely the regulations themselves but the decisions, interpretations and rulings relating to the regulatory system should be made public.

Let me note also that we were pleased to learn that the Commission plans to hold industry advisory conferences to discuss drafts of its proposed regulations and to submit those drafts for public comments. We are looking forward to this opportunity to assist in the formulation of the regulatory structure. This kind of interchange of ideas is absolutely essential to the establishment of a successful working relationship between industry and the Commission.

In appearing before you today to comment on the state of the atomic-energy business I am, of course, somewhat limited in what I can usefully say by the fact that the Commission has not as yet issued the regulations implementing the new act. We are not sure, for example, on what basis licenses will be issued, or what restrictions will be imposed upon licensees. The appearance of the regulations should answer many questions now hanging in the air. There are, however, two really basic issues inherent in the very nature of the atomic-energy business. These questions are of such fundamental importance that they will be with us for some time. The first concerns industry's need for information and the implications of that need for the security program. The second involves the scope of the licensing powers and their effect on the development of a private atomic industry. Both questions raise the same central issue: How much freedom to exercise initiative shall private companies have; conversely, how much of a central planning role should the Government exercise?

Availability of atomic information: I have become increasingly concerned about the need for more adequate information in order to operate effectively in the atomic field. I realize, as you must have realized long ago, that this is a problem of enormous complexity, and that there

are no easy answers. The reason why this is so is simple enough. At bottom, there appears to be a conflict between the information requirements of industry and the demands of the security system.

It seems to me that to achieve the goal of widespread and effective private industry participation, a reexamination of the atomic information and security system is required. More information than is presently available is needed for two important reasons. First, to attract new companies into atomic business; second, to permit those engaged in atomic work to make realistic plans for future progress. I will briefly discuss each of these points and their implications for the security system.

The achievement of the goal of widespread participation by private industry requires free access to large quantities of information about many aspects of the atomic-energy industry. Bars to the availability of information about atomic energy cannot but operate as obstacles to entry into the industry. Information should be made available not merely to those who are already interested, but, perhaps even more importantly, to those who are not yet interested, for information is required to stimulate interest.

To achieve the goal of widespread participation, access to information cannot be restricted to those who have firmly decided to enter the atomic business. Responsible management is not likely to make serious decisions until a thorough and wide-ranging study has been made. Moreover, it is clear that after such a study many companies may decide that atomic energy is not for them. Thus it may well turn out that, in a good many instances, information will have been given to companies which may not put that information to productive use. This is a consequence which must be accepted if we wish to obtain widespread participation, for there may well be a direct correlation between the number of companies who are given access to information and the number who will enter the atomic-energy business.

The new act does not merely seek to broaden the base of the atomic business by encouraging more widespread participation. Inherent in the new act, as we see it, is the idea that the nature and character of industry participation must change. Private companies will no longer merely be contractors carrying on activities prescribed in detail by the Commission. They are now expected to do more on their own, and to exercise individual initiative. This, too, has some clear implications in terms of access to information and the security system.

Under the contract system, the planning of practically all atomic activities was highly centralized. It was primarily the job of the Commission. The Commission, of course, possessed full knowledge of all aspects of the atomic business, and was, therefore, properly equipped to carry on the planning function. Private contractors who generated much of the information merely required the information from other sites necessary to perform a specified task. How much information that required varied with the nature of the task. Even here I do not believe the Commission erred on the side of giving too much information to its contractors.

If industry is expected to plan its own future course in atomic work, it clearly requires a broader access to information than it needed to perform specific Government contracts. It is almost axiomatic that the success of future planning is directly proportional to the amount

of information available. Without adequate information, industry cannot be expected to show real initiative. Without adequate information, the purpose of the 1954 act may be frustrated: Industry will not be able to exercise any more initiative than it did under the contract system.

This is a point of the most crucial importance to the success of the atomic program. As we see it, one of the real keys to the success of the American economic system is that planning and thinking have never been centralized. Many different people in many different places and positions have had the power to plan and to make decisions. Initiative has been individualized, not centralized. It is this which has distinguished the American economy from the cartelized or socialized systems of other nations. The change in the role of private industry, contemplated by the 1954 act, is a recognition that this principle should be applied in the atomic field.

I am sure that it would be unrealistic to suggest that an information program designed to stimulate widespread participation, and to enable participants to exercise initiative, would not have an adverse effect on a program of guaranteeing maximum security for atomic information. The more widely atomic information is distributed, the greater the risk will be that some information will get into unfriendly hands. The acceptance of greater risks, it seems to me, follows logically from the decisions about private participation incorporated into the 1954 act. The principal justification for accepting such risks lies in a confidence in the potentialities of American industry. It rests on the belief that the information which must be declassified, or downgraded into less secure classifications, will produce greater advances by American industry than the increased leakage of information will produce behind the Iron Curtain. I submit that this belief is amply justified by the past performance record of American industry.

Furthermore, any evaluation of security standards must take into account the extent of atomic work in foreign countries, friendly as well as unfriendly. If any restrictions are maintained over information which is available in other countries, the result of such restrictions will be to handicap American business in the race for atomic leadership. The rapid expansion of foreign atomic activities would seem to call for extensive declassification in this country.

In this connection I believe that the tendency to consider secrecy and security as one and the same is predicated on a serious underestimation of the scientific and technical capacity of foreign countries.

In 1945 when there was a tendency on the part of many to question the ability of the Russians to build an atomic bomb, our Dr. Langmuir predicted to the predecessors of this committee that the Russians would be able to build a bomb in about 3 years. In other words, a country with the will to do so, could, regardless of our secrecy policy, catch up with us in technical matters in a very short period of time. I believe that the best way to preserve or increase our lead is to rely on the peculiar advantages, namely, incentive and individual enterprise, of the American economic system. In the end, Congress must choose how much to rely for our security on secrecy and how much on the free enterprise system.

Let me make clear that I am not suggesting that secrecy considerations can or should be disregarded. What I am urging is that the new

act calls for a change in the relative weights to be accorded to the conflicting considerations of secrecy and availability of information. I would like to suggest a number of concrete steps for your consideration.

Chairman ANDERSON. May I ask a question here?

Mr. MCCUNE. Surely.

Chairman ANDERSON. You are familiar with the fact that a great many scientists talk about security by achievement—I believe Senator Hickenlooper used that phrase first, possibly—in contrast to security by secrecy.

Mr. MCCUNE. Yes, sir.

Chairman ANDERSON. I understand that you strongly endorse the development of security by achievement.

Mr. MCCUNE. Yes, sir, and by achievement resting on the peculiar pattern of American life. We have been, I think, relatively pretty good at production, and we should free production.

Chairman ANDERSON. I agree with you.

Mr. MCCUNE. First, I think that more can be done to make unclassified information readily accessible, to make industry aware of what is available without security restrictions. I know that a lot has already been done. However, atomic energy has for so long been surrounded by an aura of mystery that far too many people continue to assume that no useful information is available. I feel that we could well intensify our efforts to publish and circulate unclassified information, to compile and arrange it in forms which make it accessible and useful to those who might be interested and, above all, to publicize its existence. I would like to see the Commission pressing to get before the general public as much information as can be released under security rules.

Secondly, I believe that a great deal of information presently classified can now safely be declassified. It seems to me that this is consistent with the new declassification standard, set forth in section 142a of the 1954 act. I refer to the concept of publication of information insofar as it can be done "without undue risk to the common defense and security." We certainly recognize that there are categories of information which cannot be declassified, but we would like to stress that the balancing of considerations in determining "undue risk" should take into account the new congressional policy relating to industry participation. Declassifying information to the fullest extent feasible provides the most effective means of hastening progress and of promoting the interests of companies previously without atomic experience. This, however, would take major effort. Changes in basic classification manuals will not do the job unless effective means are taken to review, collate, and present to the public and industry a complete story in these declassified fields.

Third, to the fullest extent feasible, I suggest the downgrading of information classification and the granting of appropriate clearances for access to such information. These clearances should be granted to any person who meets security requirements regardless of whether the person or the firm involved has a contractual relationship with the Atomic Energy Commission. This principle should apply to all interested parties as, for example, architects, engineers, banks and insurance companies. As a general proposition, I believe such people

should have access at least equal to that afforded contractors who plan, design, and operate Atomic Energy Commission facilities.

Fourth, we urge the creation of one or more libraries and information centers where properly cleared people can get access to a wide range of classified information. Such an information center should be organized so that the categorization of information access associated with a securtiy system is minimized.

Fifth, a formal procedure should be established for providing access to people and to plants. It seems clear to me that to provide the necessary knowledge, more is needed than mere access to written materials. Companies presently engaged in atomic work as well as new companies interested in entering atomic work should be afforded greater opportunities to study existing Atomic Energy Commission laboratories and facilities and to obtain the advice and guidance of individuals possessing extensive experience.

It is not enough merely to give security clearances to more people. It is also necessary that there be greater freedom in the way the information can be used. Scientific progress is never very rapid when work has to be carried on in isolation. The opportunity to exchange ideas with others, even with people working in relatively unconnected lines, frequently leads to a very rewarding kind of cross-fertilization of ideas.

We have deep reservations about any attempt to control by contract the scope of legitimate inquiry. Restricting access to information by means of a "job to be done" concept is squarely inconsistent with the premise of the licensing sytsem that industry should exercise initiative. Planning, by definition, must precede the choice of job to be done. To have value, planning studies must range far beyond the bounds of any particular "job". Freedom must be granted to examine exhaustively many different alternatives. The security system should not restrict by compartments what people can study and examine. If it does, technical progress will be hampered. Furthermore, industry may be reluctant to invest its resources if it does not have the confidence that it has examined everything that will have a bearing on the prospects of its ventures.

The General Electric Co. has no interest in being "an insider" in a field to which access is restricted. We hope that entry into the atomic business will be as free as possible. The General Electric Co. has grown and prospered in a competitive economy. We deeply believe in the value of competition. The larger the number of companies that are enabled to exercise real initiative, the faster atomic progress will be. It is in such a competitive and progressive atomic industry that we should like to make our place. I feel quite certain that this, too, is the kind of industry which your committee envisioned in drafting the 1954 act.

Let me emphasize the point I should like to leave with you: To broaden the base of participation in the atomic-energy industry, and to enable the members of that industry to exercise the kind of initiative which has been responsible for America's industrial progress, greater freedom of information is an absolute necessity.

The licensing power and the development of the private atomic-energy industry: An equally basic problem is raised by the scope of the Commission's power to grant licenses and to control the activities

of licensees. In discharging its responsibilities under the licensing provisions of the act, how much control is the Commission required to exercise over who is permited to enter into the atomic business, and what is done by the participants?

Under the language of the act the Atomic Energy Commission has very broad discretion. The statutory licensing standards provide little in the way of specific, detailed guidance. The Atomic Energy Commission could use its power to grant or withhold licenses and to supervise the operation of licensees so as to retain in effect a central planning role in the development of the atomic-energy industry. The crucial issue is whether the Commission, in fulfilling its obligation, must introduce its own conceptions of what is "practical" or "desirable" into the licensing process. In other words, must the Commission insist on the right to evaluate the merits of a project before deciding whether to license it?

We come back here to the same question discussed in relation to the adequacy of information: Will initiative for atomic development be centralized or individualized? Either a liberal or a restrictive approach can be adopted. By a restrictive approach I mean granting materials and operating licenses only to projects which the Commission deems desirable. By a liberal approach I mean granting licenses for any project in which an applicant has sufficient confidence to be willing to risk his own money, without an evaluation by the Commission of the particular merits of the project.

If the first course is adopted, the result will be to stifle industry initiative. There would be little practical change from the situation under the old act where the Commission, as a matter of administrative decision, decided what projects were necessary or desirable, and then let contracts to companies willing to carry out such projects.

We urge the adoption of a very liberal approach. As a general policy, we believe that all applicants should be licensed as long as the materials are available, and the proposed use does not involve dangers to security, health, or safety. Regarding these latter factors, we urge that the Government provide positive help to private concerns so that they may meet proper standards.

It may be true, of course, that the amount of material available places a limit on the number of licenses that can be issued. While I have no information on the quantities that can be spared from military requirements, it does not seem reasonable to me that licensees' needs will constitute a serious drain in the immediate future. For more distant demands, I think that uranium sources could be discovered and developed in amounts quite adequate to provide for a very substantial industrial power program.

I recognize that, even when in plentiful supply, atomic materials should not be squandered or wasted. I doubt, however, whether this is likely to be a serious problem. The business realities of the atomic-energy industry are such that no one is likely to enter it lightly and without extensive planning. At the most the Commission should make a very broad determination designed only to eliminate projects which are so clearly frivolous as to constitute an obvious waste of nuclear material.

Assuming, then, that the quantity of available materials does not impose a real limitation on the number of licenses that can be issued, it seems to me that the principal prerequisites which the Commission

should consider are considerations of national security, public health, and safety. Except in line with the broad standard of avoiding a completely frivolous use of material, the Commission should not be expected to concern itself with whether it considers a particular project desirable or even workable. That decision should be left solely and exclusively to the applicant. I would prefer running the risk of wasting some nuclear material, to requiring new ideas to run the gauntlet of administrative value judgments. The history of industrial progress records innumerable instances where no one except an inventor and a very small group of backers had faith in a particular project. Industrial progress would certainly have been very much slower if an official Government determination that the idea is practical or desirable had been a condition precedent to the introduction of new ideas.

We recognize, of course, that the Commission will almost certainly play an active role of its own in the development of reactors and other facilities with commercial applications. It may conduct such work in its own laboratories. As you know, the Commission now owns almost all the important laboratories, and there has not been time for industry to provide its own. We do not question in any way the right and obligation of the Commission, when spending its own funds in this way, to determine very carefully what it considers worth doing. Similarly, if the Commission plans to give financial assistance to private companies, it clearly has the right and obligation to determine the most productive way of spending its money. A sharp distinction should, however, be drawn between the Commission's responsibilities in conducting its own program and its responsibilities under the licensing system. Licenses should not simply be treated as a slightly different breed of contractors. We should recognize the basic fact that the licensee has the right to make his own decisions, and that he must be given some elbowroom. It is true, of course, that licensees may be dependent in many respects on the Commission. The need for classified information and nuclear material are just two examples. If these limitations on the independence of licensees are used as a means for attaching even further strings, then the basic purpose of the licensing system may well be defeated.

In addition to the broad powers over entry into the industry—by granting or withholding licenses, classified information, or nuclear material—the statute gives the Commission additional broad powers over the conduct of licensees after entry has been granted. This includes the power to prescribe terms and conditions, as well as to suspend or revoke licenses. Under the law the Commission has very considerable discretion in the exercise of these powers. Industry has an obligation to work with the Atomic Energy Commission to fashion a licensing system which will not turn out to be the contracting system with a new label.

Specific factors: In addition to the two major problems which I have just discussed, I would like to call your attention briefly to a number of specific factors which in our opinion may have a critical bearing on the growth of the atomic-energy industry. We raised practically all of these points in our testimony and supplementary statements last year. Most of them affect, in one manner or another, the stability of atomic investments. In mentioning these specific fac-

tors now, I do not mean to suggest that they will all necessarily prove to be obstacles to atomic development. I cite them primarily as matters to which attention should now be direction to prevent obstacles from arising. It should also be recognized that there might be an adverse effect on atomic development arising from the cumulative effect of these possible impediments.

1. Continuing availability of materials: The continued operation of a licensee's business may well depend on a continued supply of special nuclear material. Since the licensee cannot obtain these materials from any other source, it is very important that the Atomic Energy Commission establish firm policies for the issuance of materials. For some uses a single allocation of materials may be sufficient. For others it may well be necessary to allocate additional material periodically. For this latter category it is important that the Commission make long-term material supply commitments.

Failure to do so may operate as a serious obstacle to private investment. Few investors can be expected to risk their money in a venture which depends on a continuing supply of a material obtainable from only a single source, if that sole supplier does not give firm assurance of a dependable supply.

2. Prices of special nuclear materials: A similar problem is raised by the price which the Commision will pay for special nuclear material. Here, too, the problem is caused by the fact that members of the industry must deal with a single customer. The Commission is the only place where a producer of special nuclear material can dispose of his products. While the act requires the Commission to acquire special nuclear material, the Commission has considerable discretion over prices. Most investors will probably be reluctant to expend substantial funds in a facility which will produce special material either as a main or as a byproduct, unless they have enough information to calculate the return on their production of special nuclear material. Section 56 of the Act authorizes the Commission to establish guaranteed prices for a maximum period of 7 years. This appears to us to be too short a period. A substantial portion of the 7 years may well be used up in the construction of the facilities, leaving only 3 or 4 years during the period of actual production of special nuclear material.

One of the most important administrative actions taken by the Commission since the passage of the new act is the establishment of pricing schedules for special nuclear materials. As you know, at the present time these pricing schedules are classified and, therefore, cannot be discussed in detail here. I believe personally that the pricing schedules should be made freely available. Knowledge of prices is one of the most important facts necessary to an evaluation of whether to enter the atomic business.

In addition to the actual prices, it would be helpful if the Commission could reveal the bases of its price determinations. In order to plan effectively, industry should be able to estimate, at least approximately, the course of future price movements. Some assurance against what might otherwise appear to be arbitrary price fluctuations is very important.

I should like also to stress the fact that price may be a very important determinant in reactor technology. The prices which the AEC sets may well shape the whole course of work undertaken by industry;

for the prices almost certainly will have the effect of fostering certain kinds of technology and types of reactors and conversely of discouraging work in other areas. I gather that one of the assumptions in the present pricing schedules is to discourage industry work on types of reactors which maximize the production of special nuclear material for weapons use. Changes in Government assumptions with resultant price changes obviously could have a serious effect on the plans of industry based upon outmoded assumptions.

I recognize that there are difficult security considerations involved here. But I do believe that a lack of information and understanding on the part of industry regarding Atomic Energy Commission price assumptions could prove to be an impediment to the growth of the industry.

3. The power to revoke licenses and to recall materials: Another possible threat to the stability of atomic investments is the power to suspend and revoke licenses, as well as to recall special material. We do not question the necessity of a reserved power in the hands of the Commission. However, we strongly urge the establishment of clear and unambiguous standards and procedures for the exercise of these powers. The problem here is similar to those previously mentioned: Investors must be given a sufficiently clear idea of the rules of the game to be able to assess their risks.

4. Insurance: My fourth point relates to stability of investments in a very direct and literal manner. I am concerned about the present inability to obtain adequate insurance for atomic risks. A continued inability to obtain insurance might well prove to be a very significant impediment to widespread and rapid development for it may be a serious barrier to adequate financing. In our opinion, this is a problem of very great importance. We do not know what the proper solution may be. However, we are confident that the atomic energy industry, the insurance industry, and the Government, working together, can solve this problem. I would like to recommend that your committee actively study the problem and invite representatives of the insurance industry to present their views.

5. Patents: It is too early to be able to evaluate clearly the effect of the patent provisions of the new act. We believe, however, that, at a minimum, the meaning of section 152 should be clarified, particularly with respect to what is intended to be included under the category of inventions "made or conceived under any contract, subcontract arrangement, or other relationship with the Commission." The basic problem arising under section 152 concerns what type of cooperative undertaking between industry and the Atomic Energy Commission may be considered to be an "arrangement or other relationship" under section 152, so that a company may be deprived of the right to patent its inventions. Industry should know in advance what kind of relationship with the Atomic Energy Commission will place an invention within the scope of section 152.

6. Atomic activities outside the United States: I do not need to point out to your committee that the atomic business is developing on an international and not merely a national scale. A worldwide market for atomic facilities and equipment may be emerging. Section 57 (a) (3) of the act raises doubts about the extent to which American companies can engage in atomic activities outside the

United States. That section makes it unlawful to engage "directly or indirectly" in the production of special nuclear material outside of the United States except upon authorization by the Commission.

We recommend that there be a clear statement of the activities which American companies will be permitted to carry on abroad. Perhaps certain activities can receive general Atomic Energy Commission authorization, thus eliminating the requirement of specific determination. It should be made clear that section 57 (a) (3) does not require individual authorization and determination by the Commission for each activity that a company may wish to carry on. If that were required, American companies might be placed under a serious handicap in competing abroad. It is certainly in the national interest to enable American companies to play an active role in a world market for atomic equipment.

I have read the recent, very interesting report filed by this committee's Raw Materials Subcommittee containing a discussion of its visits to many countries throughout the world. I believe that the worldwide interest in atomic energy is so important to this country as to merit the special attention of this committee. Perhaps you would consider the establishment of a special subcommittee to study this whole problem. One particular point which I believe could appropriately be examined is the degree and extent to which information is freely available in foreign countries as compared with that available in this country.

7. Licensing of component parts: In the emergence of the licensing system some problems may arise regarding the extent of control which is required over the manufacture of atomic equipment. The terms "production facility" and "utilization facility" are both defined so as to include "any important component part especially designed for such equipment or device as determined by the Commission." Section 109, entitled "Component Parts of Facilities," authorizes the Commission to issue general licenses for component parts if it determines that general licensing will not constitute an unreasonable risk to the common defense and security. We hope very much that the coverage of the licensing system can be limited so as to have the smallest possible effect on the manufacture of component parts. Most, if not all, component parts probably do not need to be subject to the licensing system at all. Since the operation and construction of the end product—the actual facility—is subject to careful regulation, it does not seem necessary to establish separate control over the manufacture of parts.

In conclusion, I would like to thank you for your courtesty in letting me express myself at such length. I hope that when you again survey the state of the atomic energy business many of the problems I raised will be well on the way to solution. My emphasis today on problems should not be interpreted to mean that General Electric is discouraged or pessimistic about the future. The problems are admittedly difficult and we are fully aware of the immense burden under which the Commission is now laboring. We recognize—as we pointed out last year—that the job of developing a smoothly functioning regulatory structure cannot be done at one stroke. The important thing now is that the problem be recognized, the issues faced up to and discussed publicly, and the solutions explored and reached.

Chairman ANDERSON. Mr. McCune, I can speak only for myself, but I want to give you and GE a very big pat on the back, as far as I am

concerned. I think you have summed up in this paper some of the things that the Joint Committee was talking about to the Atomic Energy Commission very earnestly only a short time ago. We are anxious to have some of the same answers. And I am sure that you have helped us by this fine paper, and I at least appreciate it very much indeed. I know the staff and the members of the committee have some questions, but I wanted to get that in.

Mr. McCUNE. Thank you, Senator.

Chairman ANDERSON. Congressman Durham?

Representative DURHAM. I have no questions, but I, too, wish to congratulate Mr. McCune on his fine statement. I think he has pointed out very clearly to the committee some of the problems we recognized when we were changing the basic act last year.

I, for one, agree fully with you that it is a matter which has to be worked out very carefully between industry and the Commission, and I am sure this committee will be glad to assist in any way it can.

Chairman ANDERSON. Senator Hickenlooper?

Senator HICKENLOOPER. I want to agree, Mr. McCune, that you have given us a very concise and in some ways quite an exhaustive and constructive criticism of the problems involved here. I join with Senator Anderson in my appreciation of your analysis.

I understand you do not have a complete categorical answer to all the questions, but you do pose the problem. I hope as time goes on we can find more and more answers to the problems, many of which we realize and some of which we have not become fully aware of as yet.

I appreciate your discussion. I have no particular question to ask you at the moment. Any questions I might have would be on specific details, exactly how would you do this or that, and I take it that you are not quite prepared to go into specific answers to all those details at this time.

Mr. McCUNE. That is correct, Senator.

Senator HICKENLOOPER. Your statement has been helpful.

Thank you, Mr. Chairman.

Chairman ANDERSON. Mr. Cole?

Representative COLE. I, too, wish to echo what has already been said with respect to Mr. McCune's statement, and to say that I regard it as one of the finest, if not the best analysis or critique of the existing law that the committee has heard.

I am curious to know your background, for the record, Mr. McCune, and how long you have been with GE, because obviously you have a very keen understanding of what is involved in what we might call the atomic industry. Tell us something about yourself, how you come to know so much about the atomic business.

Mr. McCUNE. I do not know that I claim to know a great deal.

Representative COLE. I did not say that you did. Don't misunderstand me.

Mr. McCUNE. I came with the General Electric Co. in 1928. I have been with the General Electric Co. ever since. My principal background is in engineering. However, I have engaged in general management work. I have gone back into engineering and have gone back into general management work.

My principal first complete introduction, let me say, was when I was assistant general manager of the then nucleonics departments

which had responsibility for Hanford and our overall contracts with the Commission. I was transferred out to Hanford in early 1949.

I came back into management of engineering of our large apparatus division, which had a great deal of work with the Commission. Then I became assistant manager, engineering, for the General Electric Co. at the time that Harry Winne was our vice president of engineering. Of course, he was immersed in this since its inception, as you know.

From there I transferred to my present job, responsible for all of our activities in the atomic-energy field.

Representative COLE. As a vice president of General Electric, you now have the responsibility of all GE's operations in the atomic-energy field.

Mr. MCCUNE. That is correct, sir, except the normal activities of selling them lamp bulbs, and so forth, the normal commercial relationships as a seller of goods.

Representative COLE. Was the statement which you have submitted to us today submitted to other officials of the company for approval or suggestions or criticism, and so forth?

Mr. MCCUNE. Yes; the statement which I am presenting has been read by other officials of the company. It was my responsibility, sir.

Representative COLE. The reason I asked that question is because my attention was focused particularly to the policy statements of the company which you voice on page 11, which for the sake of emphasis I should like to repeat, to the end of making certain that when you speak those policies of GE you do so with the knowledge and approval of the other responsible officials of the company. I have particular reference to your statement where you say:

> The General Electric Co. has no interest in being "an insider" in a field to which access is restricted. We hope that entry into the atomic business will be as free as possible. * * * We deeply believe in the value of competition—

and so forth, the rest of that paragraph.

Has that particular paragraph been scrutinized by the president and other responsible officials of the company and approved by them?

Mr. MCCUNE. I cannot say whether that specific sentence has been read by Mr. Cordiner. I am sure it has been read by Mr. Reed, who is the chairman of our board, and by other members of the president's office.

Representative COLE. Do you have any reason to doubt that the expression of policy in that paragraph is approved by the president of the company?

Mr. MCCUNE. No, sir; I have no reason to doubt that.

I might say that the reason I did not go to the president of the company for specific approval of this is that I have enough contact and do not feel it is anything that requires his approval. It is a statement of the way we feel about it.

Representative COLE. Having been with the General Electric Co. now for 25 years, you are confident that that does speak the belief and policy of the company?

Mr. MCCUNE. Yes, sir.

Representative COLE. What you had to say in your statement on page 12 with respect to the licensing power and the development of the private atomic-energy industry, I think is most cogent, and I should like to place my own personal endorsement on what you have

had to say with respect to the responsibilities of the Atomic Energy Commission in issuing these licenses to the end, as you have expressed it, of letting the man who is willing to spend his own money decide how he should spend it, so long as the Commission exercises its responsibility, making sure that security factors are protected and health standards maintained. That is what was intended, as the chairman has indicated, and was the intent of the committee.

You can appreciate the practical impossibility of the committee's writing into the law such broad standards of a nature that the Commission can follow categorically. We did give the Commission broad authority, but we expected the Commission to exercise that authority in just about the same fashion that you have voiced in your discussion today.

One of the reasons we did put in the law the requirement that public hearings be held each year was to make certain that those people who were dealing with the Commission and who felt that the Commission's policies in the carrying out of that authority were improper, could come to an open forum and discuss it, with perhaps some hope of solution. I think the attitude you have expressed is very proper.

Mr. McCUNE. It seems to me, if I may say so, that these hearings can go a long way toward establishing an atmosphere of congressional intent within which both the staff and the members of the Commission will feel much freer to act.

Representative COLE. In placing the 7-year limitation, we all recognized that in the early stages those 7 years must necessarily include the period of construction, but you can appreciate that it would be impossible to fix a period with respect to a man who is already in business, and make a different rule with respect to a man who was just starting in business.

Naturally, your fears are justified that since you cannot look beyond the 7 years, you do not know whether the price for the first 7-year period is going to be maintained, increased, reduced, or eliminated entirely, presenting an imponderable that makes it most difficult for you or any other potential applicant to determine the eventual outcome.

As you discussed it, the thought occurred to me that some safeguard might be written into the law to the effect that the prices should not fluctuate in any 7-year period beyond a certain percentage. That at least would give you something to go by.

For instance, the prices would not be reduced, we will say, by over 10 or 15 percent, or whatever percentage appeared to be appropriate.

It occurs to me for the moment that that might offer some cushion to applicants in evaluating their overall financial picture.

Would you care to comment on that?

Mr. McCUNE. I think something of that kind would be quite valuable. The peculiarity of the 7-year provision, as I see it, is that with a law which has just been passed, and without an industry established, you accumulate the total time required for study, for financing, for design, and for getting construction going and take it out of the 7 years; whereas 7 years from now, presuming there is a substantial industry, or 10 years from now—and I believe there will be—accumulating capital, and so forth, to go ahead will probably not be the time bar that it is now.

So that regulation has hit at the start of something in a way that it would not hit the continuing thing. That is unfortunate. I think something of the kind you suggest, offhand seems a very good solution or a desirable solution.

I have posed in here, though, the thought that if it is at all possible, the basic underlying philosophy which is going to be used in pricing might well give assurance. In other words, if you knew what you were competing against, regardless, then you could go ahead, at somewhat more a gamble, I will admit, but you still have something against which to gamble.

Representative COLE. It occurs to me that in view of the fact that this is a brandnew, baby industry, we could very well have made that pricing period 10 years for the first period in order to get the thing started, and then after the first 10-year period perhaps limit it to less than 7 years, perhaps to 5 years, with the additional proviso of avoiding extreme fluctuations in prices.

Mr. MCCUNE. I have the feeling, you see, that there is going to be a great deal of material generated and required by this country. It seems reasonable to me that private industry should be given the opportunity to produce that material and sell it to the Government, if by so doing the Government would use less of the taxpayers' money. In other words, if you are operating an obsolete facility at high cost to get material, I should think the Government would want to procure that material from industry at a price lower than from the obsolete facility.

That kind of market based on a specific policy would again let you make the gambles that are inherent in this business.

I must admit, I agree entirely with you, that what is needed is something to start it and then, secondly, the price policy is so important in determining the technology and determining the degree and extent to which a market is available to industry, that I am sure it is getting the Commission's attention, and I think it merits your attention as one of the important and serious factors.

Representative COLE. By virtue of the very fact that the industry is of such nature that the Government must at all times keep its hand on the industry to some extent, and at least for the foreseeable future be the only market for the material which is produced, then inevitably the question of prices that the Government will pay for the material is the very heart of the entire industry, is it not?

Mr. MCCUNE. Yes, to a great extent, that is true.

Representative COLE. Thank you, Mr. McCune. You have made a fine presentation.

Thank you, Mr. Chairman.

Chairman ANDERSON. Senator Bricker?

Senator BRICKER. I have no questions, except I do wish to express commendation for the clear-cut statement which has been made. I appreciate it very much.

Chairman ANDERSON. Mr. Price?

Representative PRICE. Mr. Chairman, unfortunately I arrived too late to hear Mr. McCune's statement. We are all familiar with his fine work and program. I understand from the other members it is a very fine statement. I certainly will take the time to read it and digest it the best I can.

I wish to comment that the country is fortunate that they have a man in industry with as full a knowledge of the program as Mr. McCune. I know that he has been a definite asset to the atomic-energy program. Although not a member of the Atomic Energy Commission family from the Government standpoint, he is in fact a member of it because of the close contact with it through all the years, and the fine work he has done for the Commission from the standpoint of private industry.

Mr. McCune. Thank you, sir.

Chairman Anderson. May I ask you a question or two here, Mr. McCune?

Mr. McCune. Yes, sir.

Chairman Anderson. On page 4 you mentioned your desire, the fact that you were looking forward to an opportunity to assist in the formulation of the regulatory structure. You say it is somewhat difficult to comment on the state of the atomic-energy business when the Commission has not yet issued regulations implementing the new act.

Have you been told when those regulations might be expected? Have you been advised that they are coming along, or are you in on the conferences on them at the present time?

Mr. McCune. The Commission has called for conferences, I believe. Specifically, I am supposed to be in Washington on the 9th of this month to participate for a full day in proposed discussion of the licensing regulations. We have a request from the Commission to look over a draft which they sent us, which I received so recently that I cannot comment on it, and add any other topics that we think should be discussed.

Chairman Anderson. May I express the hope that you will look at the discussion which the Joint Committee had with the members of the Commission, because there were some pretty strong expressions about our feeling that industry ought to be consulted, and rules ought to be made ready; in other words, that we not operate just by agreement after agreement, but set up a set of rules so most of these agreements could fall into the pattern of those rules. If you are called in, I would appreciate it if you would look at that testimony, if you have a chance to and if you have not already done so.

Then on page 5 you speak of the availability of atomic information, and you say:

> there appears to be a conflict between the information requirements of industry and the demands of the security system.

I think that is a very good and clear statement of what is the problem in a great many instances. Manufacturers say, "I could not possibly bid. I haven't anybody who is cleared as yet."

If we are going to have very active participation on a private basis, I think we need to review the atomic-energy security system, and I hope that you as a company may be able to participate at that time and express pretty strongly your belief that we need to have a lot more information if the industry is going to get along.

At the top of page 6 you state you are in favor of giving this information not only to those who are interested, but to those who are not yet interested. That is the crowd we need in this program.

On page 7 you stress that the purpose of the 1954 act may be frustrated if adequate information is not made available to the industry. I feel that is of great importance.

In the second recommendation on page 9 you suggested that a great deal of information presently classified can now be safely declassified. Are you familiar with the program of declassification which the Commission now has? I do not want to appear to be critical of the Commission, but do you have the feeling that perhaps we are not declassifying rapidly enough?

I know the Commission has a very difficult problem in doing that, but would it help your program of getting business interested if declassification could be a little more rapid?

Mr. McCUNE. I went on to say that I think two things are needed. First, I am quite aware that the Commission is working hard on declassification. I know full well that the total question of what is to be classified and what is not to be is probably the most baffling one that faces anybody. Certainly those who have wrestled with it have my sympathy.

I think the preparation of a declassification guide which lists information in lower categories is the answer. I frankly think what is needed is to spend money in order to review the information and make information available to the American public, as a constructive move rather than as a regulatory move. As a matter of fact, I think a review of the total information available to the Commission and a program to give it to the American public might cost somewhat less than some of the facilities that have been built. It would be expensive, but it still might be worth more to America.

Representative DURHAM. Mr. McCune, in connection with that, of course you have participated in highly classified work.

Mr. McCUNE. Yes, sir.

Representative DURHAM. Top secret work in other fields besides this field. In the course of participating in that and having to do a job with whatever Government agency, do you find it much more difficult at the present time to do your job and to participate in work in the atomic field? How would you compare them?

I am just getting at something here to see if we can get a comparison of the difficulties which we face here and those which we face in other fields as well as this. You say you cannot do it by contract work; that you do not think that goes far enough.

Mr. McCUNE. That is right.

Representative DURHAM. You say also in your statement, as I get it, that you cannot do this job on a "need to know day" basis.

Mr. McCUNE. No, sir; I do not believe you can do it that way.

Representative DURHAM. That is the way I understood your statement.

Mr. McCUNE. I think I should say that I think it has been implicit in the public's feeling—and I chose the word "feeling" deliberately—about atomic energy that we should be far more cautious in our control of everything about it than in the fields about which the public possibly knew more, and there is some reason for that, you see. It is the newness of it. Nevertheless, there is no question that in this area you move more slowly and with by far more restrictions, let us say, in my opinion, than you do if you are participating in the air defense of the country or if you are participating in its electronics work, which are also advanced technologies of prime importance to our defense.

Representative DURHAM. You said in your statement you believe we did underestimate the know-how in other countries to a considerable extent.

Mr. MCCUNE. I think we did. It may be presumptuous, but that is why I still think it is worth considering that a subcommittee of this committee might well turn its attention to the availability of information in other countries, because that is very difficult for any of us to pick up, except on an organized basis.

Representative DURHAM. When we first began the hearing on the bill last year, there was great concern whether or not you people who were already in the business would not run away with this job and have all the know-how and nobody else would get into it; but you, who have been in the business 20 years, are here today raising the same problem that was raised here by everyone—a problem which has been of concern to us—and I think that fact is of significance.

You think you still have problems also; that you do not have all the know-how, even though you have been in the business 20 years.

Mr. MCCUNE. That is right, nor can we use it.

Chairman ANDERSON. At the top of page 10, the second paragraph on page 10, you suggest that—

> These clearances should be granted to any person who meets security requirements regardless of whether the person or the firm involved has a contractual relationship with the AEC.

That was brought out by members of the joint committee. Certain types of licenses are available only to those people who have contracts, and therefore the only clearances were to people who had these contracts. The thought was that they were going to require somebody to show whether he needed the information.

A lot of people just want to speculate on it, perhaps, and do not know exactly what application their firm would make of it. I am glad you said:

> This principle should apply to all interested parties as, for example, architects, engineers, banks, and insurance companies.

They may not know exactly how the information will affect them, but they will get some benefit out of it.

I have marked down here the statement to which Congressman Cole called to your attention on page 11. I think that is a fine statement.

The one remaining statement of yours which I wished to look at was the suggestion about insurance. You feel that it is well worthwhile to have a study of the problem?

Mr. MCCUNE. Yes, sir.

Chairman ANDERSON. You would suggest that perhaps our staff and the committee should spend some time on the question and look into it a little?

Mr. MCCUNE. I think the industry as a whole would appreciate that.

Chairman ANDERSON. Finally, you said you thought the pricing schedule should be made freely available. When we got to the pricing schedules, I wanted to look at them at the time. I thought they should be made available. But the Commission has some feeling that they should not be made available.

It is your feeling that if at all possible, it should be arranged to make them available.

Mr. McCUNE. Yes, sir.

Chairman ANDERSON. I am sure I agree with you on that. I think these have to get out so people know what is going on concerning them.

Senator Gore?

Senator GORE. Mr. McCune, some of us have been disturbed over the fact that, more than 6 months after the Atomic Energy Act of 1954, not one single application for license has yet been received by the Atomic Energy Commission; that is, no application had been received when they were last before this committee, and I have seen no notice that one has been received since.

Do you anticipate under present regulations, policies and procedures, that we will soon have very many applications for licenses?

Mr. McCUNE. You pose a problem which is a little hard to answer. In the normal industry arrangement covered by license, regulations have been promulgated and are understood, and you choose whether or not to ask for a license.

You are asking me, as I understand it, whether people——

Senator GORE. I did not quite get that.

Mr. McCUNE. I say, in the normal industry regulated by license, you know what the license is, you know what it covers, you know what it entails, and you decide whether or not to ask for one.

Your question to me is whether, lacking that knowledge, people are going to apply for a license. In other words, we do not have the regulations. I think you have to have them first before you can tell how many people will apply for a license or would accept a license when one is offered.

Specifically, though, a large percentage of industry, I am sure, is counting on the fact that a licensing arrangement or other arrangement, or no arrangement, will be the requirement for going into this business. Of that I am certain.

Senator GORE. Does your company anticipate making an early application? If I have asked you a question which you prefer not to answer, that is all right.

Mr. McCUNE. You are getting me into a difficult subject. I can explain why it is difficult. I do not yet know the activities which require a license. I do not think I can answer your question without knowing the activities which require a license. The General Electric Co. intends to participate in this industry, without any question.

Senator GORE. Mr. Chairman, that seems to illustrate some of the difficulties which have been disturbing you and Members on both sides of the aisle. The vice president of the General Electric Co. does not yet know on what basis he may be able sometime to make an application for a license.

Mr. McCUNE. I expect if we need one we will get one, and I am planning and working on that basis.

Senator GORE. Meanwhile, Mr. McCune, other countries, notably Great Britain, are pushing ahead with the development of atomic power for industry. Your suggestions are quite provocative.

I wish to join the other members in expressing appreciation for your contribution. Sometimes my efforts on behalf of preserving the rights of the Government itself to move into reactor development directly may have led some to think that I did not wish to facilitate

the entrance of private industry into this field. The very contrary is true.

I appreciate your contribution, and hope we will have occasion to hear you again.

Mr. McCUNE. Thank you, sir.

Senator GORE. That is all.

Chairman ANDERSON. Mr. Holifield?

Representative HOLIFIELD. Mr. McCune, I apologize for being late today. I was unavoidably detained in my office. I have not had a chance to read your whole statement, but I have read all of your section on licensing power, beginning on page 12.

As far as I can see from reading that once over, you voice some fears that all of us have had along this line. The fact that it has taken 6 months now for the Atomic Energy Commission to come up with the statement that they are not yet ready to reveal the terms and conditions and regulations for licensing industry indicates to me that they are in a strange field which is foreign from their former functions, and that this is opening up a completely different function for the Atomic Energy Commission than any function they have had before; and it is going to be a much broader field, a field which is going to require a lot of quasi-judicial and quasi-regulatory powers and rulings.

As far as that section of your presentation which I have read, I am heartily in accord with it. It solidifies my own thinking along the line that there must be something done to implement this industry or you are not going to get any kind of advance in it. I agree with you, you cannot get a license unless you know the terms and the regulations under which you are going to operate.

I have small wonder that there have not been any license applications that I know of. When people say they will come in and do this without any help at all and on their own finances, I just cannot believe they have studied the problem as thoroughly as you have apparently studied it.

That is all, Mr. Chairman.

Chairman ANDERSON. May I read into the record a paragraph or two from a letter from Mr. Nichols to the chairman in reply to testimony we have which involves the General Electric situation. He said:

I think it appropriate to comment somewhat more fully on the letter of August 24, 1954, from the General Electric Co. In this letter, Mr. Francis K. McCune, general manager of the Atomic Products Division, General Electric Co., informed the Commission of the company's desire to be licensed to the extent required for it to manufacture and sell atomic energy equipment. Mr. McCune asked for such information as we could supply at that time concerning the scope and nature of the data that would be required in applications for licenses under the 1954 act, and offered to meet with us if a personal discussion seemed advantageous.

The letter was written 6 days before the President approved the 1954 act. It was obviously too early for us to outline the scope and nature of the information that the Commission would require under the new law and we so advised Mr. McCune in a letter signed late September 3 and dated September 7.

We assumed that if in fact the company's contemplated program began to suffer on account of the need for AEC licenses, company representatives would get in touch with us, as other companies and institutions have done, to see whether licensing arrangements could be worked out on an interim basis. Although General Electric representatives have talked with us on numerous occasions since last fall, they have not prior to today, so far as I am aware, and

so far as a check in our Washington office has revealed, informed us that the lack of AEC licenses was interfering with the company's operations, or inquired about the possibility of working out interim arrangements. This date Mr. McCune informed me that he felt that he needed to know more about our formal regulations and have a certainty that General Electric would receive a license to insure maximum progress in organizing for and proceeding with the program contemplated.

I cite that only to show that it reveals the fact that your company almost simultaneously with the passage of the act began trying to find a way to get to work in typical American free enterprise fashion on this problem, and that you are still trying to find it.

I am very glad that you continue to do so.

Are there other questions of Mr. McCune? If not, this concludes our hearings, and it could not have ended, I think, on a better note.

We were required to complete these hearings in 60 days, or were supposed to at least, from the beginning of the session, and this does conclude them within 60 days. I have a few words I wish to say at the end of the hearings.

This concludes the first annual statutory hearings of the Joint Committee on Atomic Energy on development, state, and growth of the atomic energy industry. It is our hope that in future years we will be able to plan these hearings farther in advance and make them even more useful to the committee and the general public than has been possible this year.

I believe I speak for all of the members of the committee when I say that we have found these hearings very helpful. They have brought into focus a great many of the problems involved in the development of our atomic energy industry. We shall explore these problems further during this session and take whatever steps we can to resolve as many of them as possible.

I think we might close on this note: While the law provides that the Joint Committee hold these hearings during the first 60 days of each session, this does not imply that the Joint Committee shall consider such problems only during these hearings. If there is anyone in any way concerned with any problem involved in the development, growth, or state of the atomic industry at any time, we are hoping he will come to the committee and make his problems known to us. It is only in this way that we can understand and meet the problems which it is our serious desire to help solve.

This is a new industry, and the members of the committee have very warm feelings toward it. We worked long and hard last year to lay a statutory basis for the industry, and we have a most sincere interest in seeing to it that the intention of the committee and the Congress is not hampered, either through misunderstanding in adminstration of the law or by inadequacies in the language which we have employed.

We have available to us a number of letters which have been received from firms and institutions which were invited to participate. Without objection, I will turn them over to the staff, to Mr. Allardice; and those which are more than just a perfunctory acknowledgment, he might desire to have reprinted at the conclusion of these hearings.

(The material referred to will be found in the appendix, p. 561.)

Chairman ANDERSON. The committee is adjourned. Thank you very much.

(Whereupon, at 3:30 p. m., Thursday, March 3, 1955, the hearings were concluded.)

APPENDIXES

APPENDIX A

(Referred to on p. 560, pt. 3)

STATEMENT OF JOHN W. ANDERSON, PRESIDENT, NATIONAL PATENT COUNCIL, TO THE JOINT COMMITTEE ON ATOMIC ENERGY, MARCH 1, 1955

My name is John W. Anderson. My residence is 578 Broadway, Gary, Ind.

I am founder and president of the Anderson Co., Gary, Ind., manufacturers, since 1918, of patented automotive equipment. I am also president of National Patent Council, a nonprofit, educational organization of smaller manufacturers of diversified products, inventors, researchers, and other professional groups devoted to the field of science and invention. NPC is dedicated to improvement of public understanding and appreciation of the United States patent system as the prime force motivating our American incentive economy.

For nearly 40 years I have been active in the manufacture and distribution of automotive and other products, and have been active in State and national associations of manufacturers. I was cofounder and an officer and director of Automotive Council for War Production of Detroit throughout World War II. I was president of Motor and Equipment Manufacturers Association during 3 consecutive years of World War II and have been for many years chairman of its policy committee. I am a director of Indiana Manufacturers Association. In those and other capacities I have enjoyed many years of opportunity to study problems of manufacturers, from largest to smallest. I have worked closely with many men devoted to invention and research. I have been instrumental in marketing many products embodying new and useful inventions. I am familiar with the incentives that induce men to long, and often sacrificial, creative effort—from the point of recognition of the need for an invention through to its discovery and thereafter its costly development into serviceable form suitable for distribution to the public.

While the Atomic Energy Act of 1946 was pending, I labored, in cooperation with other citizens, to direct the attention of Congress to threats to national security embodied in that act. David Lilienthal, the first Chairman of the Commission, published in 1950 in Collier's a series of atricles that, when compared with my statements to Congress, show that the Commission encountered, and the Nation was seriously handicapped by, the very conditions I had predicted would develop. Ample documentation of that fact is available. As an example, in Collier's of June 17, 1950, Mr. Lilienthal said:

"No Soviet industrial monopoly is more completely owned by the state than is the industrial atom in free-enterprise America. The Government has today an ironclad, airtight and all-embracing legalized monopoly of this vast enterprise, and of the new industrial era the development of the atom could bring to this country."

In a bulletin released to Members of Congress under date of July 12, 1946, I stated, 4 years before Mr. Lillenthal published his above-quoted discovery:

"By this bill, as it stands awaiting only the action of the House and Presidential signature to make it law, the Government also would control absolutely every industrial use of atomic energy * * *"

My statement is made in my own behalf as a citizen, as president of the Anderson Co., and as president of National Patent Council.

Your Joint Committee has before it for consideration H. R. 1777 which would amend Public Law 703, commonly known as the Atomic Energy Act of 1954. The amendment would strike out sections 153 and 154 of that act, which sections relate to and are commonly known as "compulsory licensing" provisions of the act.

It is requested, most respectfully, that your committee consider, as inherent in the Atomic Energy Act, the following facts:

(1) The act reflects a high order of skill in draftsmanship in achieving its obvious purpose, which is to set over completely, in the hands of a governmental agency, absolute control of a new source of power far exceeding, in its potential for both civilian and military uses, that of any other source of power heretofore made available for application by mankind. (See secs. 151, 152.)

(2) Sections 152, 153, 154, 155, and 159 of the subject act substantially eliminate inventive incentives, to the individual United States civilian capable of, and interested in, a creative contribution in the field of applied atomic energy, to expend any time, money, and/or effort to make an inventive contribution in any way related, or adaptable, to the production or application of atomic power. (See also sec. 151.)

(3) Such depression of incentive arises from the denial, by the act, of any independent right on the part of the inventor ever to own, or control, by United States patent, the uses of his invention, if he is a citizen of the United States; whereas a foreign national may patent and control, for civilian uses, a similar invention in the United States, without such deprivation. (See sec. 152.)

(4) The Atomic Energy Commission is granted by the act, under conditions that substantially exclude exceptions, power to assert full ownership of any invention or discovery, "useful in the production or utilization of special nuclear material or atomic energy," power to compel the owner or owners of any such invention to license others, under conditions prescribed by the Commission, to use the invention. (See secs. 152, 153.)

(5) Corporations cannot invent. Government cannot invent. Invention is a function peculiar to the individual. A patent grants only a negative right. That right, prior to the subject act, was to exclude all others, for the limited period of 17 years, from manufacture, sale, and/or use of the invention—at the will of the patent owner and to any extent he might desire. The subject act includes from that traditional function of the United States patent system inventions and discoveries "useful in the production or utilization of special nuclear material or atomic energy"—and thus removes, for the citizen, the traditional incentive to invent and produce new things useful in expanding our economy. (See art. I, sec. 8, of the Constitution; U. S. Court of Claims decision in *Consolidated Engineering Corp.* v. *United States*, 104 U. S. P. Q. 111, Jan. 11, 1955; and secs. 152, 153.)

(6) When our Government, which is presumed to be the entire citizenry, acquires a patent, that patent by every constitutional intent automatically expires, because there is none left to exclude.

To hold differently is to hold that our Government has become a competitive device imposed upon the citizen and deriving its powers arbitrarily from a source apart from any formalized expression of the will of its people.

The Government, which has granted the patent, in presuming to own it, places itself in the untenable position of having vested in itself, without authority, a right which clearly, by constitutional intent, can be possessed only by the citizen. (See art. I, sec. 8, of the Constitution.) (See also pp. 28 and 29 of exhibited address.)

(7) The subject act denies recourse to any court, for injunctive relief, by any United States citizen whose inventive property, by force of the subject act has been appropriated by license under compulsion, by the Atomic Energy Commission, for exploitation for profit by a favored citizen or citizens having had no part in the creation of the invention. (See sec. 154.)

(8) The act, instead of merely requiring a license to Government for military uses under "patents granted on inventions, made or conceived during the course of federally financed research or operations," requires that all such patents be assigned to the United States, leaving the Atomic Energy Commission in full control of possible civilian applications and uses of such inventions (sec. 159).

(9) Foreign inventors owning such inventions, for civilian atomic uses, suffer none of the disabilities imposed by the subject act upon the citizen of the United States. Foreign inventors may apply for, and receive, United States patents on such inventions, which patents they and/or their assignees, including governments of foreign nations, may control, in line with the intent of the United States Constitution and our patent laws based thereon, as they normally and traditionally have applied to the United States citizen (sec. 152).

(10) Our Government, through the instrumentality of the Atomic Energy Commission, may make available, and has made available, in foreign nations, reactor installations and inventions related to the production and utilization of atomic

energy, originated by United States citizens, and also undertakes to teach technicians of such foreign nations—all without any compensation or impelling inducement to any United States inventor—the know-how essential to most effective use of such reactors and related inventions (17th Annual Report of the Atomic Energy Commission, January 1955, p. VIII).

(11) In line with precedents established by monopolistic provisions of the Atomic Energy Act, efforts are made to compel the free sharing of costly and hard-earned know-how by corporations advanced in practice of a phase of production with corporations favored, or to be favored, by Government as competitors of the advanced corporation. Was not the stated intent of the original Atomic Energy Act (1946) to "strengthen free competition in private enterprise" and thus prevent the very monopoly granted in the present act to the Atomic Energy Commission? [Atomic Energy Act of 1946, sec. 1 (a), also sec. 1 (b) of the act of 1954.]

(12) The subject act, by the above-mentioned and other devices, goes contrary to that stated intent, contrary to constitutional intent and contrary to long-established and fundamental principles of law that have given our Nation its unprecedented growth. The act, as given effect, contrary to pretended intent, concentrates all control over the power of atomic energy, and its myriad of unexplored applications to human needs, in a governmental agency ordered and directed by men not charged with any certain responsibility, or necessarily possessing capacity, for creative contributions in the field of production or utilization of atomic energy (secs. 151, 152, 153, 159).

(13) The act discourages, substantially, and in effect excludes, participation by United States citizens in the gigantic task of creating, as has been done in the development and application of every other major source of power, through still-increasing thousands upon thousands of inventions necessary to give greatest effect to the application of such power to civilian and military needs (secs. 151, 152, 153, 159).

(14) Such exclusion of the citizen from his normal creative functions, and such unconstitutional and uneconomic concentration of power in a single supergovernment, perhaps reflects recognition of the sinister significance of the historic statemet, attributed to Nikolai Lenin, that whoever controls a nation's source of power controls its industry and therefore controls the destiny of its people. There are growing evidences, and authoritative predictions, that atomic energy may soon be recognized as our cheapest and most dependable source of power.

(15) Bill H. R. 1777 should be amended to repeal sections 152, 153, 154, and 155 of the Atomic Energy Act, and section 159 thereof should be amended to read:

"The Government of the United States shall have a free, irrevocable, nonexclusive license, for governmental uses only, under all patents granted on inventions made or conceived during the course of federally financed research, by any person engaged therein."

(16) There rests with Congress today the obligation and authority to repeal sections 152, 153, 154, and 155 of the Atomic Energy Act of 1954, and amend its section 159 as suggested, as the only means by which the vast inventive and productive forces of the United States can be released for a belated beginning toward competing, on equal terms, with other nations, in the vital race of American invention and technology toward national security through supremacy in the production and application of atomic energy.

It is submitted that:

(*a*) The proposed repeal of the four sections indicated, and the amendment of section 159, as proposed, would in no way hamper or impede governmental activities having to do with military applications of atomic energy. On the contrary, such repeal and amendment would bring more effectively into support of such operations that vast reservoir of civilian capacity for inventive diligence that has given our country the security it has enjoyed through its outstanding industrial supremacy.

(*b*) Smaller manufacturers in America have multiplied and thrived, but not often in making products identical to those in manufacture and distribution by large corporations. Big industries, by the very weight of their capital and marketing facilities, ordinarily can assert competitive strength difficult for the smaller manufacturer to match when competing products are identical. The greatest factor in stimulating men to new undertakings in manufacture and distribution lies in an opportunity to offer the public a product made more de-

sirable by a patented or patentable invention which cannot lawfully or rightfully be copied by the mammoth competitor.

The public has been challenged more than once to identify a single product of American industry that does not have embodied in it one patented or patentable invention or that has not been made cheaper and better because of patented or patentable inventions employed in its manufacture. From baker's bread to building brick, it is predicted that you will not find anything coming out of any American factory that is not so qualified.

Thousands of smaller manufacturers that exist today in America, and that provide, in the aggregate, employment to many millions of people, would not exist except for advantages accruing from production of such improved products. The public benefits constantly from the inducements provided by the protection—to inventors and to smaller manufacturers—afforded by the patent system.

No smaller manufacturer would ordinarily copy, for production by him, a product already in wide distribution by a large manufacturer. For these reasons, compulsion on the large manuacturer to permit the smaller manufacturer to copy his products would do the smaller manufacturer, and the economy in general, little or no favors; whereas, compulsion on the smaller manufacturer to let the big fellow run away with his inventions and patents would simply crush the smaller fellow and would discourage him, and all who witnessed his misfortune, from further inventive and developmental work. The surest way to fatten producing and distributing monopolies in America would be to destroy our patent system. The present Atomic Energy Act, in its important field, goes far in that frightening direction.

(*c*) Without reflection upon the patriotism or loyalty of any Americans identified therewith, may I say that no grounds have been found for doubting that if the most cunning and talented of subversive agents of an enemy government, intent upon making us incapable of our own defense, had been given a free hand to dry up civilian sources of inventive contributions to developments in all fields of atomic energy, no more comprehensive, leakproof result could have been devised than is to be found within the above identified five compulsive sections of the Atomic Energy Act of 1954.

(*d*) The subject act, in effect, places in the hands of a relatively few people, chosen by political procedures, such incentive-deadening coercive powers as feed themselves in the processes of coercion—powers impossible to contain within prescribed channels or areas. Unless at once deprived of its instrumentation for compulsion, the act seems certain to mushroom relentlessly into the most destructive politico-economic Frankenstein ever unleashed upon the confused leaders, and the forgotten innocents, of anly civilization.

Only a complete reversal of the coercive policy reflected in the present Atomic Energy Act can restore to civilians the traditional incentive, offered by our patent system, to provide, for the service of our people, that dynamic flow of atomic invention without which we can have no reasonable hope for national security.

The tyrannical concept—dominant in the present act—that creative contributions can be coerced—embraces a fatal fallacy discredited in human experience. And inventive incentive does not thrive under featherbedding of lush appropriations—but springs instead from eager effort on the part of the individual citizen to earn and acquire, for himself, economic security through sharing modestly in the wealth he creates for others.

Only by substituting—for the discouraging penetrations of compulsions under the subject act—the eager flow of invention from an encouraged citizenry, inspired and unafraid, can we repeat our phenomenal performance in other fields of applied power and restore, by thus enlisting the practiced creative muscle of its diligent people, America's power for survival.

It is suggested, most respectfully, that National Patent Council will welcome any request by your committee for cooperation in supplementation of the facts herein discussed.

There is submitted, as largely pertinent, with each of the multiple copies hereof, a printed copy of an address entitled, "What Feeds Free Enterprise?"—delivered at the annual meeting of Cleveland Patent Law Association, December 9, 1954.

It is hoped that perusal of that address may direct, from long experience in the field of invention, production, and distribution, further light upon the problems above discussed.

Respectfully submitted.

JOHN W. ANDERSON.

WHAT FEEDS FREE ENTERPRISE?

Address by John W. Anderson, President, National Patent Council at Annual Meeting of Cleveland Patent Law Association, Hotel Cleveland, Cleveland, Ohio, December 9, 1954

To have been invited to discuss with you today the primal forces from which our fantastic growth as a Nation has come, and to which we must look to keep our children free, brings to me a sobering honor and an inspiring challenge.

Many times in the history of civilizations men have gathered, as we are gathered today, to pause and ask what may be done to help delay, or perhaps forestall, those cyclic changes that brought, at last, destruction to once flourishing civilizations.

The cycle through which civilizations find their growth and their decline is shaped by one unchanging law—a law by which all works of men are made to rise or fall.

The law of self-preservation, our Creator's first and primal law, impels us each to seek, according to his understanding, his own advantage—and to join with others in labors promising advantage to the individual through advantages accruing to a group of which he is a part.

Whenever any man presumes to look with disdain upon a society that recognizes, as its motivating force, God's primal law, that man becomes, perhaps unwittingly, a menace to the civilization that feeds him.

The air today is filled with clamorings by misguided citizens who would have us ignore the fact that man's efforts to create and produce are greatest when he sees hope of the honest winning of extra substance for his rainy day.

PRIMALISM TEACHES SURVIVAL

Our Creator serves, and has always served, His mysterious purposes by giving first to man the command that he survive—that he defend himself—that he labor to provide for his needs of the day—and for his needs to come.

That command to survive, our Creator gives also to every other living thing—to every beast—to every writhing, creeping creature on this earth.

In the competition between species, for power for survival, mankind has won—above all, because he has learned the value of cooperation with others of his kind—according to rules of conduct that untold centuries have taught promote security for the individual and for the tribe.

So long as they thus follow the basic teachings of primalism, nations, races, civilizations, advance in their cultures—and in their strength for survival.

Examine any beneficient law of man and you will find it rooted, however deviously, in the primal law—in the need to inspire men to creative and productive labor through confidence that they will be secure in their enjoyment of a share of their contributions to the welfare of their neighbors.

With what profound reverence for its Creator should any man regard the infinite wisdom reflected in the primal law! With what deep gratitude for divine mercy should man contemplate the eternal truth that there is never permitted the slightest change in any of God's laws!

History teaches that the primal urge, when not intelligently directed along lines of well-considered self-interest, can destroy even the bravest works of man. Channeled by well-defined rules of conduct, the primal urge inspires man to creative diligence that builds strength and security for the tribe—for the Nation—and for the civilization.

PROMISE OF PROFIT INSPIRES

Why do some men preach that we should in effect nullify the one provision of our Constitution regarded by its framers as of such importance as to justify its implementation within the text of the Constitution itself?

What body of men has ever moved closer to God, with clearer vision of His primal purposes, than those who wrote in our Constitution:

"The Congress shall have Power * * * to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;"

What more convincing evidence could be asked that the men who laid the foundation for our patent system knew that promise of individual profit induces men to greater effort to produce than does the whip of tyrants?

Can you think of a more stimulating emancipation of the mind of man than comes from assuring him that he may enjoy a share of the fruits of his creative diligence?

Surely, nothing within man so clearly proves his kinship with his Creator as does his power to create.

Inducement to create has generated in America, in the brief span of years elapsed since given effect in our Constitution, more benefits, more advantages, more power for security, than had been created altogether by the untold billions of human beings that had gone before.

PATENT SYSTEM IS "NERVE CENTER"

Is it any wonder that those who desire to enslave the people of our Nation to false doctrines have recognized our patent system as the very "nerve center" of our expanding national economy—the prime catalyst of our unprecedented industrial civilization?

By damaging that nerve center they know they may weaken even the most remote of all the interrelated forces by which we build and maintain our strength for defense.

Let us examine some of the attacks made with such frightening success within recent years upon that "nerve center of our national economy."

Naturally, the purpose of all such attacks is to destroy individual incentive to create, produce, and fairly possess.

Webster's dictionary defines incentive as "that which incites, or has a tendency to incite, to determination or action." Among synonyms given are: Goad, stimulus, encouragement, and inducement.

Incentive stirs to performance by an inducement offered. Incentive differs from motive in that motive lies within the individual, rather than without. Incentive is something offered the individual from without, to stir him to action in his own interest.

Once the scope and significance of the march toward the destruction of such incentive in America is understood, no God-fearing man can doubt his duty to help stop, at whatever cost, the subtle, purposeful drive to make us a nation incapable of our own defense.

There are many among us whose philosophy—unwittingly or not—would doom us to unending servitude under soul-crushing tryants who live arrogantly apart from our Creator and all His works.

Such tyrants—and would-be tyrants—labor today on many fronts to turn useful inventions of man to his enslavement.

GOVERNMENT PRETENDS TO OWN PATENTS

First let us examine a monstrous and growing cartel that hovers over us, flouting our Constitution and attempting to control our industries according to the concepts of an ill-advised bureaucracy.

The pretense of governmental agencies that they may own and manipulate pools of patent rights has no support in law and no justification in any economy relying upon inducements to the individual for its propulsion.

In addressing a meeting of the Dayton Patent Law Association, Dayton, Ohio. on March 11, 1949, I quoted in part from a communication of October 9, 1947, addressed by National Patent Council to the Department of Commerce, Office of Technical Services, Washington, D. C., as follows:

"A patent grants only a negative right. That right is to exclude others, for the limited period of 17 years, from manufacture, sale, and/or use of the invention—at the will of the patent owner, and to any extent he may desire.

"When our Government, which is presumed to be the entire citizenry, acquires a patent, that patent by every constitutional intent automatically expires, because there is none left to exclude.

"To hold differently is to hold that our Government has become a competitive device imposed upon the citizen and deriving its powers arbitrarily from a source apart from any formalized expression of the will of its people.

"The Government, which has granted the patent, in presuming to own it, places itself in the untenable position of having vested in itself, without authority, a right which clearly, by constitutional intent, can be possessed only by the citizen."

A FRIGHTENING CARTEL BY GOVERNMENT

Governmental agencies have not ceased to pretend to own patents.

They consistently represent that royalty-free licenses are available to any citizen upon application—under any patent the Government presumes to own.

However, upon inquiry, addressed to the various governmental agencies pretending to own patents, as to the conditions under which they would issue a license to a citizen, each replied imposing conditions varying from one department to another, such as requirement for cross-licenses, the acquisition by Government of "know-how," the power of Government to revoke the license at will, and other conditions, all tending to destroy any possible urge on the part of the citizen to invest money and effort in making the invention available to the public.

Government decries cartels, decries combinations, decries monopolies.

And yet here we have governmental agencies, seemingly innocent of any understanding of the destructiveness and unconstitutionality of their machinations, laboring, for their own ill-conceived advantage, to create such pools of patents as will enable them to work their will upon American industry.

Any congressional committee that would at this date undertake to disclose to the American public the astounding maneuvers of such agencies, in control of such patent pools, would find itself perhaps confronted with frantic opposition from a mass of interlaced interests of the cloak-and-dagger variety.

Unrepeatable stories, from impeccable sources, of the ruthless "divorcements and divestments" that have been worked in the name of such governmental pools of patents, sound so improbable as to expose to expert ridicule, almost with certainty, any man, however sincere, who would repeat them.

Only reasoned and hopeless fear on the part of the corporations and individuals oppressed by men of government and politics who control such unlawful patent pools could account for their silence under punishment.

THE POWER PLANNERS

So, here we have a huge cartel, cloaked in pretense of public service, offering to the citizen, with impressive futility and superficial generosity, free licenses to patents presumed to be owned by Government, merely as a smokescreen behind which our industrial system is being weakened in areas in which our security is under severest attack.

Can we afford to do nothing to check this frightening governmental cartel, which is using its presumed power to license as a means for compelling the commitment of more and more patent rights to its growing pools?

The lack of any constitutional right of Government to pretend to own and manipulate patents seemingly is fully understood by the offending governmental agencies.

None of them has ever brought any suit for infringement of any patent presumed to be owned by Government.

It is understood that such agencies, somewhat humorously at times, assure that no such suit will ever be brought.

Eminent lawyers have expressed doubt that we have ever had a United States Supreme Court that would fail—upon competent presentation of the issue—to order the abandonment of all pretense of Government to own United States patents.

Can we escape belief that governmental agencies pooling patents have launched upon a deliberate plan for enhancing their power to exploit industry and to serve their own political purposes, knowing full well that their activities are as unlawful and as unconscionable as those of any group of mercenaries that ever preyed upon the rights of others?

COMPULSORY LICENSING DESTROYS INCENTIVE

Another incentive-destroying proposal, advanced persistently for many years and long resisted successfully by National Patent Council and its friends, is for compulsory licensing of patents.

The principle of compulsory licensing is uneconomic and is clearly contrary to constitutional intent.

It dulls the spur to invention. It destroys incentive to produce and distribute new and better things—for better living.

Few men would be likely to risk their earnings to build a market for an invention that others might copy and sell in competition, without such others first having incurred any of the costs of developing and pioneering the new product in its market.

Reduce the prospects of the inventor to obtain financing for his invention and you have reduced, if not destroyed, his incentive to invent.

The Constitution empowers Congress to grant the inventor, in compensation for his inventive contribution, an "exclusive" right—the right to exclude others from making, using, or selling the invention.

Unless the inventor disposes of those rights, in whole or in part, by sale or license, he is presumed to enjoy them exclusively for the period of 17 years fixed by Congress as the life of his patent.

That is his reward for bringing into the service of the citizens of the United States an invention that did not before exist.

There is no basis in the Constitution for any compulsion upon the inventor to part with the property he has created.

So why should we destroy, in contempt of God's primal law and in contempt of the Constitution, all incentive, all inducement, of the citizen to create for free enterprise new tools with which to implement its growth?

Is it wise to say to the inventor, "No matter what you may create, it may by force be taken from you, leaving you powerless to determine the price, if any, to be paid you for it"?

A DANGEROUS GRAB FOR POWER

The ghost-written bills that have been presented to Congress over many years attempting to establish compulsory licensing as a fixed principle of our economy all have reflected the paralyzing philosophy of confused men who never cease, behind legislative scenes, to reach for personal power at the cost of destroying the citizen's incentive to create.

The Chicago Tribune, perhaps at least as proud of its enemies as of its friends, in discussing National Patent Council's opposition to compulsory licensing, with reference to the new Atomic Energy Act, stated editorially on November 21, 1954:

"The House had stood for exclusive patent rights. The insistence on compulsory patent sharing came from a small bloc in the Senate which filibustered until it got what it wanted. The objectors, eager for adjournment so that Congressmen could go home to campaign, were black-jacked into submission."

National Patent Council was founded in part to provide help in resisting such ill-advised legislation as proposed in the Kilgore "science mobilization" bill of 1943.

Aided by a few friends of the patent system, your speaker helped defeat that bill.

The council, formed 2 years later, fought to amend the patent provision of the original atomic energy bill.

The House, by an overwhelming majority, adopted the amendment supported by the Council.

The Senate, in joint conference committee, sent the bill back to the House in its original form, with no chance for a record vote as the bill was finally adopted. Events since, including Lilienthal's admissions published by Collier's, have proved the council's opposition to the bill to have been well founded.

THE BIKINI TESTS—AND PANIC

The original Atomic Energy Act made virtually impossible any application of atomic energy to civilian needs, under incentives that had brought out of nowhere such phenomenal inventions for application of the power of steam, electricity, and petroleum.

Bureaucracy has presumed to suppress, under pretense of necessity for national security, all urge to convert atomic power to the building for civilian industry, of added strength upon which we must rely for national security.

Pretense that atomic secrets could be hoarded by our governmental divisions and bureaus has proved fallacious.

Enemy nations bent upon destruction of our American way of life have seemed almost completely free to appropriate and apply to civilian, as well as military uses, all of our hard-earned discoveries in the basic science of atomic energy and in the mechanisms, systems, and methods invented and developed by us for the application of atomic energy to military uses.

Now Russia stands mockingly with a claim that she has been first to apply atomic energy in the production of power for civilian uses. In the meantime our inventors continue discouraged and our civilian industry remains hog-tied by ill-advised legislation vesting absolute power in a bureaucracy not clear of suspicion of deep infiltration by secret servants of that godless and lawless larceny which bears the name of communism.

While the Atomic Energy Act was pending in 1946 National Patent Council said to Congress and the Nation,

"The McMahon atomic energy bill (S. 1717) reflects the blind arrognace of bureaucracy gone mad. The bill would drive American inventive diligence underground. It would create a vast black market in dangerous atomic inventions. Subversive task forces have been endeavoring for years to get past Congress legislation that fould destroy all incentive for American inventors and manufacturers to continue to advance American industry. In this atomic bill, those subversive forces would deal a disastrous blow to American security."

Commenting upon Senator Vandenberg's statement that the passage of the Atomic Energy Act, without amendment, was "necessary until Russia (1) agreed to international control of atomic energy and (2) agreed to internal inspections in Russia," Fantus Chase, writing in Invention News and Views for March 1948, said:

"Why should Stalin now so agree if to do so might inspire, in our Atomic Energy Act, a change which would remove the now-proven power of that act to suppress atomic invention in America? And why should Stalin wish, or work, for any change in the type of thinking, either in our foreign or domestic affairs, that has given, however innocently, to him and his hopelessly enmeshed German scientists, this priceless advantage in their race to rob us of our supremacy in the field of atomic energy?

"With such an obvious risk of losing a perhaps decisive edge, in what he seems to have chosen to make a world war for universal human enslavement, much dumber men than Stalin would be expected to do nothing but stand pat."

David Lilienthal, the first Chairman of the Atomic Energy Commission, in his article, Free the Atom, in Collier's magazine of June 17, 1950, stated, "When this (atomic energy) law was enacted 4 years ago no one could see that there was any alternative to an airtight Government monopoly; certainly this was my own view at that time."

In a publicity release of September 20, 1948, National Patent Council stated, "Instead of hastening the day of effective international agreement to outlaw atomic energy in war, and the day of Russia's consent to internal inspection and control of atomic energy in that country, our Atomic Energy Act so sorely disables atomic development in this country that Moscow, in the light of the Kremlin's known objectives, would not be likely to agree to anything that might release our atomic energy development for propulsion by the traditional incentives of our patent system."

What, and who, prompted such desperate pressures upon Congress to disregard clear warnings from American industry and walk this Nation into the greatest of all Communistic traps—from which we may not—after 10 years—be able to extricate ourselves in time to regain the strength we have lost in the race for civilian application of atomic power?

More strength to Congressman Cole of New York, and all those who support him in his valiant fight to turn our Nation back from the dangerous path our Congress chose in 1946, in disregard of warnings, voiced by stanch Americans in Congress, that NPC was right—and that the House was right when it, by overwhelming vote, adopted the NPC substitute for the sovietized patent provisions of the atomic energy bill.

PATENT SYSTEM FEEDS FREE ENTERPRISE

Not all who oppose the patent system, or advocate compulsory licensing, consciously would destroy America.

They simply do not understand how God's primal law, working through the patent system, functions to feed free enterprise new inventions, new tools by which it implements its growth.

It is hoped that all men of the patent law profession present here tonight will go all out to persuade their friends and clients to support vigorously efforts in the next session of Congress to repeal the first provision for compulsory licensing ever enacted—in all the 164 years of existence of our patent system.

Otherwise, the principle of compulsory licensing, which is the kiss of death for our patent system and for the free economy it feeds, may spread as a manifestation of tyranny which, in the language of the London Times of August 11, 1846:

"Generations of wise and good men may hereafter perceive and lament and resist in vain."

WHY STARVE THE PATENT OFFICE?

As if pooling of patents by Government, aided by licensing compelled by law, did not carry enough promise for the eventual slowing down of our economy, we are confronted with constant efforts to reduce the amount of the appropriation for the operation of the Patent Office, to a degree that quite definitely tends to restrict its functions and thus discourage inventors.

The appropriation is already so limited as to have prevented adequate provision for much-needed reorganization of the Office, for the expeditious handling of patent applications in the Office and for the expeditious preliminary study of the various arts by patent lawyers desiring to determine, for a client, the patentability of an invention.

The persistent battle on the part of the Patent Office to reduce through competent procedure its backlog of pending applications receives scant encouragement as operating funds are limited without regard to the vital part the Patent Office must play in translating into industrial momentum the intent of the Constitution.

HAZLITT SUGGESTS WATCHDOGS

May I commend for your early reading an editorial entitled "Watchdogs for Congress" by Henry Hazlitt on page 97 of Newsweek for December 6, 1954?

Mr. Hazlitt presents forcefully the futility of subsidizing the "fairy godmother" hallucinations of some of our officials abroad—who are engaged naively in the work of "buying gratitude and dependable allies" through the reckless distribution of billions of dollars exacted from the American taxpayer.

Mr. Hazlitt points out that "There is no clear evidence, in spite of constant reiteration, that the postwar recovery of Europe has been any faster than it would have been without our aid."

Mr. Hazlitt says that if a "private year-round 'watchdog' committee were appointed by Congress to study the work and recommendations of, say, every Federal agency that spent more than $100 million a year, the effect would be to restrain the present alarming expansion of spending programs and to save the taxpayers billions of dollars a year."

EXALTATION BY DISSIPATION?

Why do men preach that we, as a nation, can best exalt ourselves by dissipating our substance in vast gratuities to governments of foreign nations, which gratuities many believe bring more harm than good to the people of those nations.

What an amazing spectacle is presented by a Congress that would quarrel with our Patent Office about a single million dollars of appropriation denied the Office, below its stated minimum needs, and then would continue an expanding program of tossing billions of our taxpayers' dollars across the big waters, perhaps to no purpose except to pamper and weaken nations on whose strength we may some day want to rely.

Don't blame Congress—blame the man in your own shoes.

Why permit yourself to become so preoccupied as to be inactive in the defense of our patent system? Why not help vigorously those who see clearly the danger to our national security through attacks upon our patent system.

This is no occasion for extended arguing of questions as to the wisdom of vast donations to foreign governments. The need for facing those questions will catch up with us inevitably.

CONGRESS MUST UNDERSTAND

However, what chance has our incentive economy to survive when even the men we send to Congress have so little understanding as to starve the very system that feeds free enterprise?

What chance do we have under the kind of legislative philosophy that encourages throwing with one hand, by billions, the fruits of free enterprise much farther than George Washington threw that mythical silver dollar—while the

other hand chokes the institution that is the prime catalyst of our entire industrial economy?

Can you thing how even skillful planning could devise a more effective scheme for national suicide?

Will our legislators ever learn that in applying pressure to the goose that lays the golden eggs the neck should be avoided?

Possibly we should seek some miracle by which to transmit to governments of favored foreign countries an understanding of what feeds in America the free enterprise that in turn feeds them.

Such understanding might prompt those governments wisely to reverse slightly their own traditions.

To prevent collapse of the source of their benefactions, might they not wisely volunteer to remit to our Patent Office, out of the bounty it has generated for them, the comparative pittance that would enable that Office to enhance propulsive incentives in our economy?

Such acceleration would produce constantly greater wealth for our friends abroad to share with our citizens, already bewildered by stories of wastes committed, in the name of government, within our own borders.

Since foreign rulers seem always to have great influence with our leaders, perhaps they could persuade those leaders to put an end to misguided efforts to throw the biggest possible monkey wrench into the machinery of our patent system—which feeds the American brand of free enterprise.

WHAT IS FREE ENTERPRISE?

The term "free enterprise" too often is understood to mean enterprise free from all restrictions—free from all law except the jungle law of tooth and claw.

Any economy subjected to that concept of enterprise would leave no incentive, no inducement, to any man to create, to produce, or to accumulate.

In a land so cursed, few gardens would be planted—for want of police protection. Government would of necessity be one of force for loot.

A nation grows in strength only as its enterprisers have imposed upon them restraints that protect the individual—restraints that assure the citizen that what, by diligent effort, he may lawfully accumulate, will not be taken from him by force.

The power of our Nation's enterprise today has grown from its defenses of the citizen against various forms of incentive-destroying thievery.

THE POWER TO TAX IS THE POWER TO DESTROY

Abuse of the power to destroy by excessive taxation has, alone, persuaded many normally creative citizens to abandon productive effort and join the ranks of those who would take much and give nothing.

Let the carefree dispensers of the fruits of your labors and mine be warned that, while this Nation may survive their spending sprees, it can do so only if creative diligence, which feeds free enterprise its means for growth, is stimulated somewhat in proportion to the wanton waste of what it produces.

WHY DISCRIMINATE AGAINST INCOME FROM INVENTIONS?

National Patent Council is proud to have initiated the discussion that led to the enactment of the first legislation providing for more liberal treatment, from the standpoint of taxation, of patent income.

Much remains to be done in this direction.

The incentive toward invention and development decreases as confiscatory taxation of patent income increases.

In many instances, where a share in corporate ownership provides the income from patented inventions, double taxation decreases the inventor's incentive to create and develop new things useful to our people.

INCREASED PATENT OFFICE FEES WOULD DETER INVENTORS

Now let's take a look at another prospectively punishing attack on inventive incentive, and upon the patent system.

And in this connection, I must, at the risk of offending some very good friends of National Patent Council, insist that many patent lawyers and some patent law associations, have, most surprisingly, demonstrated a seeming lack of under-

standing of the true economic function of the patent system they so faithfully serve—when they recommended an increase in the fees charged inventors for the privilege of offering their contributions to feed the fires of free enterprise in America.

Any such increase in fees could serve only to increase available funds for distribution to foreign governments, some of which might some day welcome the weakness in our economy that must follow further stifling of its vital catalyst, which is the patent system.

In the interests of generations of Americans yet unborn, I beseech all patent lawyers, as accredited midwives at the delivery of inventions in America, to renew allegiance of God's primal law, to the Constitution, to the patent system—and to the industrial economy that it feeds for growth.

And may you, and all other citizens, give active allegiance also to every other law and institution in America devoted to the promotion of individual incentive to create and produce—for a modest share of the wealth and advantage thus made available to others.

COURTS CAN HELP FREE ENTERPRISE

Among all the ill-considered blows struck at the heart of our incentive enterprise system in recent years, perhaps none wounded and deterred creative leadership more than misguided assaults upon the patent system at various levels of the Federal judiciary.

Out of the Supreme Court, for example, have come adverse majority and minority opinions, sometimes going so far as to hold that only revolutionary inventions providing a foundation for an entire new and important art were entitled to patent protection—ignoring the fact that discoveries in basic research have reuired implementation by myriads of inventions providing practical applications to human needs.

The "flash of genius" theory—holding that invention, to be worthy of patent protection, must have resulted from some supernatural visitation—would deny reward to that inventive diligence that almost invariably precedes the creation of any new and useful thing. That unrealistic theory has disturbed and discouraged many men capable of the persistence necessary for creative achievement.

When judicial assaults upon our patent system culminated in a Supreme Court Justice remarking that the only patents the Supreme Court had not invalidated were those upon which it had not been able to get its hands, piratical manufacturers—of whom we have always too many—were emboldened to copy—at their pleasure—any patented invention—or inventions in the process of patenting—that may have suited their thieving purpose.

Courts have made wanton infringement a much more attractive thing for well-financed copyists—a crushing thing for the smaller competitor.

So let history record that in our time alien philosophies designed for subversion of our incentive economy were well disguised and were most subtle.

Let it be written that subversive concepts have proved most salable to men farthest removed from practical experiences that provide the only sure guidance toward constructive application of those inexorable, primal forces that can be made to build for our security but which, when not enough restrained, induce predatory men to destroy faster than others can build.

Contemptuous castigation by the courts, to whom they had looked traditionally for evenhanded, understanding protection, has discouraged many inventors—and those who, with reasonable basis for confidence, would finance their inventions. It has discouraged manufacturers who might otherwise have been willing to assume the risks of the usually costly job of refining an invention for the market and of producing and distributing it.

Fortunately, not all of our Federal judges have too far forgotten that "patents make jobs"—that incentive-inspired inventions have built America—and that the fires of free enterprise must be fed by our creative leaders or American industry, the decisive factor in two world wars, must slow down.

May our courts endeavor to revitalize and hold intact that great industrial catalyst—that feeder of American incentive enterprise—that builder of our national security—which is our patent system.

WRITERS CAN HELP

Besides sound and helpful writers like Henry Hazlitt, whom we have quoted above, we have, influencing legislative and judicial opinion in America, the type of opinion-molding author who writes brilliantly—but who gains his perspective by looking hastily through keyholes at stages often carefully set to influence him.

May I please remind you of what I consider to be a very significant reflection of a corresponding lack of understanding on the part of many of our industrial people—and certainly on the part of those who write and publicize for them—as to the economic significance of our patent system?

You no doubt have seen on television—with increasing frequency—stories of individual industries—usually a presentation, in chronological sequence, of events and periods marking milestones of growth of the particular corporation.

Often these so-called documentaries are pitched to glorify the management.

No doubt the management quite often is deserving of great credit which perhaps has not been fully accorded publicly.

However, I have not seen—and I doubt that you have seen—a single one of these great films that has made any mention whatever of the fact that without contributions of inventions inspired by our patent system the industry glorified by the film could not have had the growth it now may proudly boast.

Quite recently was seen such a television presentation intended to promote appreciation of outstanding contributions to the public, and to our economy generally, by a rather well-known manufacturer of photographic equipment.

What writers call an "interesting twist" in the story was the decision of the founder—many years ago—that the market for the company's products was saturated and that further progress would be at a minimum and uninteresting.

So the founder sold the business.

The story then proceeded to dramatize the stages by which the company moved new products into new uses—broadened its field times over—and grew into proportions never dreamed of by the founder.

Why should the American public be denied the most vital truth ever wrapped up in one of those stories of phenomenal industrial progress?

Should not the people of this country be told that except for the incentives offered by the patent system to inventors to spend sacrificial hours, perhaps years, bringing forth a new invention of impressive value to the public, industrial growth would really end at about the point where the founder of that company thought it had ended?

No citizen who once understands how our patent system functions to provide incentive to create and produce for better living and greater security for all of us can ever be twisted to serve the purposes of communism.

One of the contributions of National Patent Council to be added, when adequate funds—and the added personnel that such funds will finance—are available—is the convincing of writers and producers who dramatize—in pictures—such industrial progress, that it does not detract from its stature to admit, in effect, that management "couldn't have done it" without the help of the inventor—seeking a chance for personal profit offered by the patent system.

SUSTAINED INCENTIVES MAKE FOR GROWTH

The inventor may work independently, in a basement, bedroom, garage, or other one-man shop.

Or he may be salaried by a corporation and in addition may share in proportion to the value of his contributions to the corporation.

Much of my time, these days, is spent in directing the invention, development, production, and distribution of devices that lend competence to one of the most prevalent of major mechanical assemblies to be found in America.

I refer to the more than 50 million motor vehicles—with all their functional components—most of which components have originated and have been perfected and produced outside the gerat research and testing laboratories of large corporations.

The manufacturing business that I founded in 1918 and of which I remain the active administrative head, is operated on the principle of motivation by incentive.

Its salaried inventors and their estates are given in addition a liberal and permanent share of what their inventions produce—in royalties from licenses issues, or in assumed royalties on products embodying their inventions and made and sold by the company.

Incentives in some form are provided for everyone who works for the company.

Into such incentive arrangements goes, before Federal taxes, more cash than the company ever retains after taxes.

If any of your members want to see the extent to which the primal law may be permitted to build momentum, happiness, and good will into a modern manufacturing organization, he is privileged to see me at our factory in Gary, on any mutually convenient date.

I shall appreciate the opportunity to show to any of you how we team together—how our sound growth is achieved.

Such a visit might be justified alone by your opportunity to see the headquarters of National Patent Council—to meet its staff—and to understand more about how it functions and what it has achieved for you and for the Nation.

PATENTS MAKE JOBS

One of the primary purposes of the founding of National Patent Council was to correct—in the public mind—the impression created so expertly by propagandists long having access to vast communicative facilities of the Government, that patents were instruments of monopoly and were bad for the Nation.

Through almost 10 years of efforts of National Patent Council, reflected primarily in its clipsheet, Invention News and Views, and in its research reports (all reaching, by request, editors whose publications in turn reach regularly an estimated readership of about 100 million people), the public now understands that "patents make jobs"—that inventions feed free enterprise—and that the patent system fires incentive to invent and to produce.

The public has been challenged more than once to identify a single product of American industry that does not have embodied in it patentable invention or that has not been made cheaper and better because of patented or patentable inventions employed in its manufacture.

From baker's bread to building brick, we predict that you won't find anything coming out of any American factory that is not so qualified.

WHAT CAN WE DO?

To sum up, let us all band together to help our Government out of the business of pretending to own patents.

That can be done only by definite legislation.

Be prepared for an almost overwhelming barrage of deceptive adverse propaganda when that is undertaken.

Next, let us get rid of all compulsory licensing—before the concept spreads to eat the heart out of inventive incentives upon which our economy has relied for growth.

And let us persuade Congress to give a fair trial to generous financing for the Patent Office so that it may hold its most values employees and attract other men of high competence. Let us provide that office with money with which to modernize its equipment and facilities. Thus may it add even greater impetus to our industrial economy.

Let us abandon any thought of increasing Patent Office fees—at least until long after we have quit coddling vote-getting projects with lush appropriations and have quit donating multiple billions of dollars to purposes of foreign governments.

Let us add impetus to invention and development in America by giving the inventor and his investors—as to Federal taxes—treatment at least as liberal as that given other groups in the matter of depletion of resources and in the matter of capital gains.

Let us free atomic energy for competitive application under the American brand of free enterprise—with full incentive to invent, develop, and produce under the unhampered inducements of our traditionally productive patent system—supported understandingly by each of the three great divisions of our Government.

And let us uncourage legislation to invalidate United States patents owned or controlled by any foreign government.

THE PUBLIC WILL HELP—BUT ONLY IF YOU LEAD

Thanks to persistent educational work by National Patent Council, over many years, the American public, we believe, is ready to support any well-publicized movement in any of the various directions above suggested.

What the American public will support, its representatives in Congress will support—if the issues are clearly and impressively presented.

National Patent Council has earned, and intends to retain, the confidence of editors, commentators, columnists, educators, and the public. Its sincerity and the soundness of its philosophy command growing respect at legislative and judicial levels.

With the help of enlightened Americans, may our people be persuaded to discourage devotion to larceny as a principle of personal, corporate, and governmental policy.

Let us all support unfailingly all men willing to consecrate themselves to the task of persuading our people to return to the constitutional principles of God-fearing primalism—from the orderly practice of which our facilities for better living—and for maintaining our security as a nation—must continue to come.

NORTH AMERICAN AVIATION, INC.,
Los Angeles 45, Calif., February 2, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Office Building, Washington, D. C.

DEAR SENATOR ANDERSON: We appreciate the invitations to me and to Dr. Chauncey Starr to appear at the forthcoming hearings of your committee on the "development, growth, and state of the atomic energy industry."

While we will follow these hearings and the actions of the committee and the Congress with a great deal of interest, we do not at this time have any matters which have not been previously presented which we consider of sufficient import to require an appearance.

Our interest in the nuclear field as an equipment manufacturer includes the design, development, and construction of both power and research reactors. In a jointly financed project between the company and the Atomic Energy Commission, we are participating in the 5-year reactor development program and are under way in the construction of a sodium graphite reactor experiment in this regard. We are also privately financing our work in the research reactor field, and are now negotiating with several medical, industrial, and educational institutions who are interested in acquiring such machines when appropriate details are arranged, including governmental approval. It would appear that the effect of the new Atomic Energy Act on our activities will not be evident until a term of transition has been allowed for the implementation of the new legislation.

We, of course, stand ready to cooperate with you and the committee at all times.

Sincerely,

J. L. ATWOOD, *President.*

PORTLAND GENERAL ELECTRIC CO.,
Portland 5, Oreg., February 25, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Senate Office Building,
Washington, D. C.

DEAR SENATOR ANDERSON: Your kindness in permitting my company to have until March 4, 1955, to submit comments on the present atomic-energy legislation is appreciated. Although my comments will be brief, we feel that the points mentioned are of the utmost importance to electric utilities, such as the Portland General Electric Co., in regard to their entering actively into the construction of an electric generating plant using nuclear materials for fuel.

At this time no insurance can be obtained to cover damages from an explosion of a reactor with its possible damages both local and possibly in remote locations, owing to fall-out at great distances from the plant location. Although it is appreciated that a disaster of this character is extremely remote, the fact that it can occur makes the risk greater than most private utilities can afford to take. It is recommended that some limited amount of insurance be specified, say $5 million, and that amounts of damages in excess of this sum, should they occur, be assumed by the Government. On this basis it is felt a workable insurance policy could be devised.

The limitation of 7 years now placed on pricing of fuels and byproducts is such that it is impracticable to make adequate studies of power costs to determine financial feasibility of a project. With an anticipated research and design requirement of about 3 years before the start of construction, and probably another 2 to 3 years to construct the plant, there would remain only 1 to 2 years with a firm price on fuels and byproducts. I trust that your committee will appreciate that with no possible knowledge as to how pricing may fluctuate, this is an inadequate period in which to gain any real operational experience or to write off investment costs. Typically, as you know, the permanent financing, bonds, etc., to finance such a plant would be based upon a much longer period of time, usually 20 to 30 years, for the long-term debt securities, such as

debentures or perhaps first mortgage bonds, respectively. It is felt that firm prices should be established which will start with the date a plant goes into operation and remain effective for a reasonable period for plant writeoff, say 20 to 35 years. If prices are adjusted downward as the years pass, this adjustment should be applied to existing contracts for the remainder of their life.

The prices which have been established by the Atomic Energy Commission for materials are such that they make atomic powerplants attractive only in very high-cost fuel areas, based on any type of reactor and generating plant now under consideration. It is felt that if wide distribution of plant location is desired new pricing policies will have to be considered which take into consideration existing local fuel costs or local power costs if the area is served primarily by hydroelectric power as is the case in the Pacific Northwest.

To us the question of disposal or processing of used fuel is quite unclear. Until more definite information on this important factor is available, establishment of operating costs remains uncertain. With ownership resting in the AEC, it is felt that all storage or processing should be their responsibility at specific quoted prices.

Regulations as to licensing have not yet been promulgated. Without these as a guide, industry has little to go on in making a proposal to the AEC. Because of the vast amount of research yet to be accomplished, the fact that great improvements may be expected in later reactors and generating plants over those started early it is felt that experimental licenses should be issued initially, with a proviso to convert to a full commercial license after it has proven itself. A rapid depreciation write off for tax purposes should also be provided so as to permit cost of conversion to conventional steam or new type reactor if this becomes necessary during the plant's life to keep its operating costs competitive with current power generating practices and costs.

If several private utilities such as the Pacific Northwest study group, join together to form a generating company for atomic power, each company exposes itself to becoming a holding company under the provisions of the Public Utility Holding Company Act of 1935, which presents many undesirable conditions.

It is probable that various private utilities will find it necessary to pool their resources and organize a generating company to be owned by them, which company would sell back to its sponsors all power generated. Accordingly, it is believed that such private utilities should not be considered holding companies by reason of this arrangement, and legislation should be enacted to exempt them from the Holding Company Act of 1935 by proper amendment to section 2 (a) (7) of the act. In order to be in harmony with the intent of the present Holding Company Act, this amendment might especially be designed to exempt such private utilities from being considered holding companies as are already under either State or Federal regulation, and which are physically interconnected in a given geographical area within which the energy produced could be economically and feasibly transmitted and sold.

Because of war the development of nuclear physics has been tremendous and carried on almost exclusively at Government expense and with the Government holding all the right to the knowledge gained. Under normal times we would in all likelihood have reached similar goals more slowly and at the expense of private and public research, with patents being issued as discoveries and developments justified them. It is, therefore, felt that patent restrictions of the present law are too stringent and that normal patent laws should be made applicable, provided that such patents as the Commission may feel should be classified for security reasons shall be classified and their use restricted as the Commission shall deem proper.

Your courtesy in receiving these comments and consideration of them is appreciated.

Sincerely yours,

THOS. W. DELZELL.

ROCKY MOUNTAIN SECTION
OF THE AMERICAN WATER WORKS ASSOCIATION,
Santa Fe, N. Mex., February 15, 1955.

Hon. CLINTON P. ANDERSON,
United States Senate, Washington, D. C.

MY DEAR SENATOR: As Chairman of the Joint Committee on Atomic Energy your assistance is requested for the enactment of suitable legislation specifically outlining the supervision and control of radioactive wastes for the protection of public health.

While in my particular professional field I am not directly concerned with the sanitary treatment of affluent waste materials, I am, as chairman of the Rocky Mountain section of the American Water Works Association, naturally vitally interested in the overall program of this association.

The attached resolution has been handed to me for my study and within my abilities to analyze the situation, I personally approve this resolution.

The real purpose of this letter, however, is to serve to introduce to you Mr. Harry E. Jordan, national secretary of the American Water Works Association, who desires to see you on this particular matter and expects to be in Washington very shortly. In order that you might have some knowledge of Mr. Jordan's plans, I am taking the liberty of addressing you in this connection and hope that you will grant him your courtesy at the time he asks for an appointment with you.

With my kindest wishes, I am

Very truly yours,

THOMAS J. EATON,
Section Chairman.

RESOLUTION ON CONTROL OF WASTE MATERIALS AND PROTECTION OF WATER RESOURCES IN THE DEVELOPMENT AND UTILIZATION OF NUCLEAR ENERGY

Whereas the expanding development of nuclear energy and nuclear materials including their commercial and industrial utilization, as authorized by the United States Atomic Energy Act of 1954 will involve major problems in the control of waste materials so as to prevent significant health hazards from the planned disposal or accidental release of contaminants to the environment; and

Whereas it is particularly important that water pollution or other impairment of surface or ground water resources be prevented; and

Whereas State and local health departments and other agencies in the several States and the United States Public Health Service have legally delegated responsibilities for protection of the health and safety of the public, including supervision over the control and disposal of industrial and other waste materials, which responsibilities must be recognized; and

Whereas for many years State and local health departments, the United States Public Health Service, and other agencies have studied the problems of water pollution, and have developed technical and administrative procedures for the control of waste materials and other environmental contaminants and, in many States, for supervision over the development and use of water resources: Therefore be it

Resolved, That the American Society of Civil Engineers recommends that in further modifications of the Atomic Energy Act: (1) The inherent responsibilities of the States and of the United States Public Health Service in their respective jurisdictions for the protection of health and for supervision and control of the disposal of radioactive wastes and protection of water resources should be specifically recognized in this act; and (2) the Atomic Energy Commission should be clearly authorized to encourage and assist State health departments and other responsible agencies, by training and other means to develop their knowledge and competency and to assume responsibility for health and safety aspects of nuclear energy operations.

This resolution has been officially approved by the joint policy committee of American Water Works Association, Federation of Sewage and Industrial Wastes Associations, Water and Sewage Works Manufacturing Associations, Conference of State Sanitary Engineers.

It has also been approved by the sanitary engineering division of the American Society of Civil Engineers.

PROPOSED ADDITIONS TO THE TEXT OF THE ATOMIC ENERGY ACT

The addition of three new sections in the Atomic Energy Act is suggested, as follows:

1. Section ——. Agency jurisdiction: Nothing in this Act shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to control of environmental health hazards or the protection of water resources.

2. Section ——. Control of water pollution: Every licensee under this Act who holds a license from the Commission for the commercial or industrial utilization of nuclear material, medical therapy, or research and development shall be sub-

ject to the supervision and regulations of any State public health department and/or water pollution control agency having jurisdiction, and shall also be subject to the jurisdiction of the United States Public Health Service under the terms of Public Law Numbered 845 or its successor Act, with respect to the control and disposal of waste materials.

3. Section ——. Water rights: Every licensee under this Act who holds a license from the Commission for the commercial or industrial utilization of nuclear material shall be subject to the laws of the State where the licensee's facility is located, which laws govern the development and use of water resources.

Alternate 3. Section ——. Water rights: Nothing in this Act shall be construed to affect the authority or regulations of any State agency or the validity of any State legislation governing the rights to, the development of, or the use of water resources.

ROCHESTER GAS & ELECTRIC CORP.,
Rochester, N. Y., March 4, 1955.

Senator CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
United States Senate, Washington, 25, D. C.

DEAR SENATOR ANDERSON: It is noted in proceedings of the current hearings before the Joint Congressional Committee on Atomic Energy that reference is made to the electric companies public information program. We therefore respectfully request that the following statement of operating principles of that program be incorporated into the record of the hearing.

The electric companies public information program is conducted on behalf of 71 business-managed electric companies, located in virtually all geographical areas of the Nation. Public relations counsel for this program is Bozell & Jacobs, Inc., 2 West 45th Street, New York 36, N. Y.

In order to avoid misconceptions regarding the functions and scope of this program, I am enclosing the formal statement of purposes and objectives of the public information program, adopted in 1954 by the steering committee, which directs public information policy matters, and signed by myself as chairman, with a similar request that this be made a part of the record.

As established in this statement of principles, the primary function of the public information program is to:

"Prepare and disseminate information of such a nature that it will:

"Promote the most favorable climate among the general public investors and employees for continued expansion of the industry;

"Support the objectives of the electric utilities in matters of public policy;

"Discourage further extension of Government generation of electricity."

The statement further points out that:

"PIP does not engage in the preparation or placement of paid advertising in any medium; in general statistical research, or in activities directly to influence legislation or the administration of existing laws."

During the hearings reference was made to the affiliation of Edward R. Trapnell, former special assistant to the General Manager of the Atomic Energy Commission, with Bozell & Jacobs. Mr. Trapnell is not directly connected with the public information program except to the extent that the operating electric companies who are members of this program are actively engaged in the development of nuclear energy for peacetime uses. To that degree, Mr. Trapnell has been and will continue to be available on a consulting basis to the program.

Thank you for your consideration of this statement of our position.

Sincerely,

ROBERT E. GINNA,
Chairman, Steering Committee,
Electric Companies Public Information Program.

PUBLIC INFORMATION PROGRAM PURPOSES AND OBJECTIVES

The primary and distinctive function of the electric companies public information program (PIP) is to prepare and disseminate information of such a nature that it will:

Promote the most favorable climate among the general public, investors and employees for continued expansion of the industry;

Support the objectives of the electric utilities in matters of public policy;

Discourage further extension of Government generation of electricity.

PIP works on three levels—national, regional, and local.

On the national level, it supplies information to writers, commentators, editors and publishers—including radio and TV networks and the principal press services; and it provides facilities for spokesmen of the companies in stating their views of industry policies and accomplishments, or in answering attacks on the industry.

On the regional level, it helps to provide industry and informational support for area objectives of company groups; and it provides both a forum and a transmission channel through which timely matters affecting the industry may be presented and discussed for the purpose of achieving unity of action by companies in their respective regions.

On the local level, it supplies information, material, and recommendations to be used by the companies through all available avenues of communication to customers, employees, stockholders and other special groups in pursuance of the purposes and objectives stated.

In carrying out these functions (which are regularly coordinated with related activities of the industry) PIP in addition to its defined responsibilities—and to the extent of its facilities and as these organizations desire—is a vehicle for distribution of factual information developed by national groups supported by and representing the electric companies.

PIP does not engage in the preparation or placement of paid advertising in any medium; in general statistical research, or in activities designed directly to influence legislation or the administration of existing laws.

ROBERT E. GINNA,
Steering Committee Chairman,
Electric Companies, Public Information Program.

E. I. DU PONT DE NEMOURS & CO. INC.,
Wilmington, Del., January 28, 1955.

Hon. CLINTON P. ANDERSON,
House of Representatives,
Washington, D. C.

DEAR MR. ANDERSON: We have given careful thought to your invitation of January 22, to be heard during the public hearings of the Joint Committee on Atomic Energy which are related to "development, growth, and state of the atomic energy industry." We feel that there is small likelihood of our being able to contribute constructively to the discussion of the subjects listed in your release of January 19, and so have come to the conclusion that we would not ask to be heard on any of these matters.

The Du Pont Co. has considered on numerous occasions the question of its participation in the peacetime development of atomic energy. Inasmuch as it appears that that development will be directed primarily toward the generation of power and since our commercial activities are clearly in the manufacture and distribution of chemicals, we feel that other companies would be much more competent than we to play a role in the commercialization of atomic energy powerplants. Because of our disposition not to participate in the power project, we do not think that we can contribute importantly to your deliberations.

This, of course, is entirely aside from the work we are doing as contractors for the Atomic Energy Commission at Savannah River, but it seems to me that our work there is quite far removed from the subjects your committee will be discussing and hence not particularly pertinent. Of course, if there is any specific problem on which you think our advice or comment would be helpful I know you will not hesitate to call on us.

Sincerely,

C. H. GREENEWALT, *President.*

RILEY STOKER CORP.,
Worcester, Mass., January 26, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Office Building, Washington, D. C.

DEAR SENATOR ANDERSON: Thank you for your letter of January 22 in which you extend me an invitation to furnish you with my comments and observations with respect to policies, programs, and actions of both the Atomic Energy Commission and industry.

It is not possible for me to do so, in the limited time available, for the reason that I am under the necessity of immediately leaving for an extended business trip to the west coast.

I am, however, confident that you and your committee will recognize the desirability of giving industry and private capital every reasonable opportunity and incentive, consistent with national security and public welfare, to continue the development and utilization of nuclear energy for industrial, medical, agricultural, and other peacetime purposes because of the potential benefits which will accrue to our national economy and the well-being of the American people under such circumstances.

Cordially yours,

RILEY STOKER CORP.,
L. E. GRIFFITH, *President.*

NEW YORK, N. Y., *January 31, 1955.*

CORBIN C. ALLARDICE,
Executive Director, Joint Committee on Atomic Energy,
Congress of the United States,
Washington, D. C.:

We acknowledge and appreciate receiving Chairman Anderson's letter of January 22 announcing forthcoming hearings with respect to Atomic Energy Act of 1954 and inviting our participation therein. We regard these hearings as timely and of great potential interest to industry, hopeful that they may be productive of considerable enlightenment regarding the regulations and procedures which the Commission intends to put in effect under said act to implement industry participation in atomic energy field and hasten the arrival of economic atomic power. We do not believe there has been sufficient elucidation or experience since passage of 1954 act for combustion engineering to present any general suggestions with respect thereto, but we are specifically and deeply concerned with section 53 (e) (8) which requires any private enterprise licensee of special nuclear material to indemnify the Government from any damages resulting from the use or possession thereof. The magnitude of the risks involved plus potential third party liability arising from unfortunate nuclear incidents make it impossible for any private enterprise to participate in atomic energy fields where such hazards are involved since adequate private insurance is unavailable now or in prospect. Without indemnification equivalent to that now afforded, Commission's prime contractors engaged in work involving atomic hazards being made generally available to commercial licensees any broadening of industry participation in accordance with the intent of Congress as expressed in the act seems wholly improbable. I shall be willing to appear personally to testify in respect thereto if deemed desirable by the committee.

BRODERICK HASKELL,
Vice Chairman,
Combustion Engineering, Inc.

BOZELL & JACOBS, INC.,
New York 36, N. Y., March 4, 1955.

Senator CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Post Office, Washington 25, D. C.

DEAR SENATOR ANDERSON: Reference having been made to our organization (Bozell & Jacobs, Inc., a national advertising and public relations agency) in the hearings before the Joint Committee on Atomic Energy, Congress of the United States, on development, growth, and state of the atomic energy industry, it is respectfully requested that you consider the contents of this letter as proper material to be appended to the record of the hearing.

The association with Bozell & Jacobs of Edward R. Trapnell, former special assistant to the General Manager of the Atomic Energy Commission, is discussed on pages 61–66 of part 1 of the printed record of the hearings (for February 1, 1955). This subject is covered in the attached news release of the Commission, dated December 22, 1954. In view of the testimony on this matter, I would like to request that the release also be made a part of the record along with this letter.

Bozell & Jacobs is a 35-year-old advertising and public relations agency, providing complete advertising and public relations services through 12 closely integrated offices throughout the United States. The original, and still the home, office of Bozell & Jacobs is in Omaha, Neb. The main office for eastern operations is in New York. Other offices are in Washington, Baltimore, Indianapolis, Chicago, Minneapolis, Kansas City, Shreveport, Houston, Seattle, and Los Angeles. These offices handle more than 300 accounts of all types and in nearly every field of industrial and commercial activity.

Among accounts handled by the New York office is the electric companies public information program, a service to which electric utilities throughout the country subscribe; this is considered as one of the 300 clients. In the conduct of this program, a great deal of information dealing with the whole field of atomic energy has been made available to the participating companies. The basis of interest of the electric companies in atomic energy is set forth in the attached copy of a speech by Mr. Trapnell which reflects the agency's policy in this area. If possible, I would like to have this speech also included in the record since it sets forth the basic reasons for the attention given the development of atomic power on behalf of this client.

Bozell & Jacobs was the first advertising-public relations agency to set up a nuclear energy information division. The staffs of the agency's offices are well qualified in technical fields. (Just as Mr. Trapnell is a specialist in the information aspects of nuclear energy, the agency also has many other specialists to serve its clients.) For nearly 5 years, we have followed the development of nuclear energy closely because we believe the field is one of great responsibility for American business and because of our conviction that the greatest possible public understanding of atomic energy is necessary to the maintenance of America's leadership in both the military and peacetime applications of this energy source. This applies to all of our clients affected directly by the atomic age, not to the electric industry alone.

The head of our nuclear energy information division is Vincent R. Fowler, a vice president in our New York office. Mr. Fowler, when manager of our Northwest operations (1950–51) was the editorial consultant on the basic pilot plan of industrial dispersion when this program was activated by the National Security Resources Board. He continued as an information consultant to the Office of Defense Mobilization on a public service basis, working on Project East River, and currently is an available consultant to ODM on a without-compensation basis.

At the February 1 hearing, additional reference was made to Bozell & Jacobs which indicated a misconception of the relationship of this agency to the Atomic Industrial Forum, Inc. Our association with the forum was confined to assistance in execution of details of organization in 1953; we understand we were selected for this assignment because we were the only public relations agency which had projected its interests actively in the direction of peacetime applications of nuclear energy. The account executive assigned to this did such a good job that he was offered the post of executive manager of the forum, an offer which he resigned from Bozell & Jacobs to accept. We have had no contractual relationship with the forum; we placed two small advertisements for it (agency commission, $87.65) but have performed no other service.

I wish to comment specifically on one point of the testimony submitted to your committee with respect to Mr. Trapnell's continuation as a contract consultant to the Commission. This is an arrangement under which he would be available to the Commission for consultation and assistance, based on his long experience in the national atomic energy program, but only on the initiative of the Commission. His contract, in accordance with the provisions of the Atomic Energy Act, requires that he have a proper clearance based on extensive and time-consuming investigations as provided by statute and is effective only when he is on assignments authorized by the AEC. This clearance of itself does not entitle him to any access to classified information as you know but assures only that he would be promptly available to the Commission in case of need. I believe it is sound public policy that a man in whom the people of the United States have invested 9 years of training and operating experience should continue to be available to serve his Government.

Sincerely yours,

BOZELL & JACOBS, INC. (N. Y.),
DONALD D. HOOVER, *President.*

REMARKS OF EDWARD R. TRAPNELL AT WEST NORTH CENTRAL REGIONAL MEETING OF THE ELECTRIC COMPANIES PUBLIC INFORMATION PROGRAM AT SIOUX CITY, IOWA, JANUARY 6, 1955.

(NOTE.—By resolution of the west north central regional group of PIP, these remarks are sent to participating companies. Mr. Trapnell joined the nuclear energy information division of Bozell & Jacobs January 2, having been special assistant to the General Manager of the Atomic Energy Commission and otherwise associated with the Commission since its inception. He continues as a consultant to AEC.)

This is my fourth day in the field of advertising and public relations as applied to the electric power industry. Time is running out for me, as a newcomer, to tell you how to run your business. Since I may learn better before the week is out, I'd better take advantage of this opportunity. The title assigned to me—"Atomic Energy"—is a wide open invitation.

I feel at home with the public relations people, having served my time on newspapers and in Government information work—at least I'm sufficiently at home to be aware of the commonly held views as to those professions in which the amateur is the superior of the professional.

You doubtless have found your engineers and operating people seldom hesitant to make a positive and final judgment as to the public reaction to a given course of action by the company. I assume you also have experienced some disquiet at the bland assumptions sometimes made on the part of the topside management that a really smart public relations man can bring about any desired public response at any time.

Such attitudes constitute a great hazard to the public utilities business in America today.

The main reason I hoist the warning flags against such thinking is the importance of operating all the time on the principle that the utilities are in business to stay. Your public relations activities must be on a long-range basis.

The term "public service" is no misnomer. The very label gives the utilities business what, in the words of the atomic scientists, we might call a long half-life. Half-lives of various radioactive forms of the elements range from a few microseconds, or millionths of a second, to the tens of thousands of years. We can't put any such time bracket on business operations, but you can rest assured there will be a public utility business supplying needed services to the ever-growing complex of urban life as long as we humans continue to occupy this particular satellite of the sun.

Your segment of this public service is the marketing of energy. We believe that over the long haul, the best way to do this is by independent companies, privately owned, publicly regulated as needed, and operated with a full sense of responsibility to the public and with the initiative necessary to continuously provide an adequate public service at the lowest possible net cost to the using public.

It is the acknowledgment of this responsibility and the application of the initiative that makes the utilities interested, industrywide, in atomic energy.

If you believe you are in business to stay, you'd better be interested in atomic energy. Nuclear fuels, over the long haul, are going to be an important source of energy, important to both the economic health and military strength of the Nation, and it is the initiative of the electric power industry which is counted upon heavily to bring about the development of atomic power.

Since you are fully aware of the projections and outlook on the Nation's energy future, this is no time to examine the numbers. The stake which the utilities business has in atomic energy is clearly indicated by the stimulus given by the electric companies to the development of atomic power.

But, you may ask, why should we worry about the public information aspects of atomic energy development?

For three reasons: First, because one day the industry—and the Nation—will depend heavily on nuclear fuels to meet the Nation's requirements for energy.

Second, because without the initiative and stimulus of the electric utility industry and a sound public understanding of the problems of development of atomic power, the development will be slowed, with consequent loss to the Nation and to the industry.

Third, because establishment of a sound public understanding of the overall job and your role in it will go a long way to assure the industry will not be pilloried in furtherance of schemes to accomplish ends other than the supplying of energy to meet the Nation's needs.

For our guiding policies in this public information program, we need look no further than Abe Lincoln's advice about fooling people. Lincoln might also have said—at least it is a natural corollary—that to avoid fooling the people, we must avoid fooling ourselves.

We should not fool ourselves as to the real public interest in the development of atomic power. We must not fool ourselves as to the possibilities of political exploitation of atomic power. We must not fool ourselves as to the hazards of government controls and government subsidies. And we must not fail to recognize and support the potential early applications of atomic power in other environments than United States public utility generation of central station power.

In tribute to the people who direct the PIP program, I would say that from my long association with the atomic energy business, it is sometimes hard to keep from fooling yourself. As one who never worked closer than the fringes to the actual research and development work in AEC laboratories, I frequently found it possible to work up very simple explanations for things the scientists found quite complex. It always turned out that the things I didn't know made the things I did know not so. At first it was very disheartening.

Then I recalled one of my early city editors who said he didn't want reporters who could spell. He preferred those who frequently consulted the dictionary. It is a good habit in the atomic energy business. But away from the purely technical side, there are mileposts and benchmarks by which we can make firm measurements and take sightings ahead with some confidence.

To take sightings ahead, you have to look ahead—and up. There must be the underlying optimism which has characterized America's progress up to now. You have to have faith that the human species is not about to destroy itself, that man is not on the verge of junking and abandoning the little knowledge and understanding he has gained in some thousands of years, and that man's modern works, his institutions and his cities, are not about to be utterly defiled and devastated by the holocaust which could result from the loss of control of the forces which can contribute to his continued growth.

You have to believe that the American effort to build a better life and a better environment is a constant effort, that freedom is an end as well as a means, and that if we are both strong and smart we will continue to grow as a nation in wisdom and stature. If you don't believe these things, then you don't belong in the utilities business, or in any other business.

If you do believe them, then by raising your sights a bit to get a long-range view of the job of supplying needed services to a properly demanding public, you come to the conclusion that the utilities are compelled to be interested in atomic energy.

The case was cogently stated in the testimony submitted by the Atomic Energy Commission last summer in support of the revisions to the Atomic Energy Act. I quote:

"In the face of the mounting pressure on our present energy sources, mastering of a new and potentially very large source cannot prudently be deferred."

The figures underlying this conclusion are available to you through PIP and indicate that by the last quarter of the century, we will need nuclear fuels. Both AEC and the big group of utilities working on the problem have made clear that the job will be a long, hard pull. The principally concerned industry, made up of those who generate and distribute electric power, is preparing for the job—and for the day.

From the nature of the job and the fact of its difficulty stems to a large extent the requirement for a public information program in support of the national effort. Another point as to which you should not fool yourself is the fact that the atomic power field is not the private domain of the privately owned electric utility systems.

The development of atomic power, as we use the term, is a truly national effort. It involves research laboratories, scientists in many fields, engineers, chemical companies, equipment manufacturers, medical people, public-health officials and Government agencies through which have been invested billions of tax dollars. And among those interested and active, and properly so, in this field are the agencies sponsored by the Federal Government to develop and exploit energy available from natural sources. You can be sure that if the utilities don't take a leading part in the development of atomic power, they will assuredly take a tailing part.

But as the Nation's principal marketers of energy, the electric utilities industry may lay its claim to the first interest—the key interest. It is more than an interest, it is a responsibility.

And yours is a most vital interest. It involves your very livelihood and life. If you fail to demonstrate the advantages of privately owned, independently managed, progressive-minded, service-stimulated, electric utilities, then atomic energy, which is already listed in the budget as a natural resource, may become another of those natural resources which furnish the rallying point and platform for substituting a different form of ownership and management of the business of supplying the public with energy.

But the utilities are showing the initiative, they are demonstrating these advantages. The last listing of the atomic power study groups by the Atomic Energy Commission included 38 utility companies out of a total of 66 business organizations.

A great deal of the stimulus to the AEC study program has come from the utility field. An electric company, the Duquesne Power & Light Co., was the successful proponent for the 60,000 plus kilowatt PWR, the pressurized water reactor, first large-scale experimental plant for the generation of power from nuclear fuel.

As another example, one of the study groups, organized and headed by a great utility system, the Detroit Edison Co., is working on what is probably the most advanced technically, and most difficult of achieving, nuclear reacting system for the generation of power. It's a tough job. If these forward-looking companies win their bet, it won't be by pulling a rabbit out of a hat—although the rabbit may still have a place in the picture because the reactor is known as a fast breeder.

Now all of this adds up to a big public information job. The factors which make it so are numerous. Just to list a few:

1. The public has a bona fide interest as well as curiosity.
2. Public dollars are involved.
3. All signs indicate the electric utility industry will one day be, at least partially, dependent on energy from nuclear fuels.
4. The industry is bearing a large share of the nongovernmental cost of atomic power development.
5. The private development of atomic energy offers a real opportunity to demonstrate the strength and vigor of the free enterprise system for a more rapid development of atomic energy.
6. The element of natural resource, built-in by political history if not by nature—but there just the same—establishes a basis for possible substitution by public action of the type of organism which does the job of generating and distributing electric power to the using public.
7. A lack of public understanding of both the nature of the development job and the real role of the electric companies could result in an undermining of public confidence of these privately owned public utilities.

If you recognize these factors, then you have no choice as to what you do about atomic energy. The utilities must get into the business and the public relations people have a job to do as much as the scientists and engineers, the power economists, and the operating people. And you, as information suppliers, must have at your fingertips the information which will enable you to keep the thing in perspective both for your own associates, from the top to the bottom of the companies, and for your investors and customers.

A former Chairman of the AEC described the mushroom cloud which ushered in the atomic age as a cloud of purple adjectives. He referred to the lurid descriptions of the bombburst as well as to the fanciful descriptions of the new era and the great atomic revolution. We have been plagued by these fairy tales for years, but, thanks in great part to the PIP atomic energy work, we are making progress in undoing them.

I believe we are going to see that revolution, all right, but we may not recognize it while it is going on. The major influence won't be atomic power, it will probably be isotopes. The revolutionary results won't be labeled "atomic energy." Advances in medicine, agriculture, metallurgy, industrial processes and techniques, and products of all kinds are already beginning to flow as a result of the knowledge gained from the use of isotopes.

This offers the utility public relations channel an opportunity to perform a service, with a net gain to the industry. Atomic energy still has appeal and will continue to have it for your customers and John Q. generally.

But aside from the real problem of bringing about the development of atomic energy, and aside from the public-service aspects of the business, there is the new element of self-preservation which has been injected into the picture. Let the fault lie where you put it, but in addition to the job of preparing yourself to serve the country by harnessing a new source of energy, the privately owned electric companies must now defend themselves against a charge of some kind of subtle but grandiose conspiracy to snatch the fruits of atomic development for purposes of exploitation of the rate-paying public. The facts and logic may be on your side, but they must be allowed to stand in clear relief beyond the shadows of unrelated issues.

This is no one-shot campaign. This is no year-to-year operation. It must be a long-range program. Your policies and programs must be designed to stand for as long as it takes for the Nation to realize the full potential of atomic energy, as long as it takes to absorb the new technology and bring the constructive applications of atomic energy within the framework of a free enterprise economy.

But remember this: If utility public relations policies in the atomic energy field are in fact or can be made to appear as designed or practiced for any other purpose than to bring about the most rapid, most efficient, and most effective and nationally beneficial development of an important natural resource, then both the industry and atomic power development will suffer.

When you weigh all of these facts, you come to the conclusion that the actual technical, developmental, or operating preparations of the utilities for participation in atomic energy work cannot be separated from the public information aspects of the job.

This threefold responsibility of the electric power industry in the development of atomic power is unique. Let me close by restating it.

First, the Nation will need the new source of energy and as the primary marketers of energy, it is the job of the utilities to push the development of nuclear fuels with all their might.

Second, the nature of the development effort and the areas for misunderstanding are such that the utilities must see to it that the American people have an understanding of the problem which will assure the most effective national effort for development of the peacetime constructive uses of atomic energy; and

Third, even if there were no other reason for the electric companies to carry on a continuous and intensive public information program in the field of atomic energy, the very requirement of self-preservation compels an unstinting effort to see that the American people understand the nature of the atomic development effort and the true role of the electric industry in support of the national program.

UNITED STATES ATOMIC ENERGY COMMISSION

Washington 25, D. C.

No. 586.

For release in morning newspapers, Wednesday, December 22, 1954.

EDWARD R. TRAPNELL LEAVES AEC STAFF

K. D. Nichols, General Manager of the United States Atomic Energy Commission, today announced the resignation of Edward R. Trapnell who has served for the past 2½ years as special assistant to the General Manager in Charge of Congressional Relations.

Mr. Trapnell, who joined the national atomic-energy program in 1946 as public-relations adviser to Lt. Gen. L. R. Groves, commanding general of the Manhattan project, is leaving the Commission to join the New York advertising and public-relations firms of Bozell & Jacobs, Inc. He will serve in the Washington office of the firm.

Mr. Nichols, in accepting Mr. Trapnell's resignation, said he left a "record of accomplishment and trail blazing in several aspects of the public reporting and governmental relationships of the program," and asked that Mr. Trapnell continue to serve as a consultant to the Atomic Energy Commission.

Lewis L. Strauss, Chairman of the Commission, said he regretted Mr. Trapnell's leaving the AEC staff, where he had "worked so constructively for all the time of the Commission's existence." Mr. Strauss said his own periods of service on the Commission had given him an opportunity to observe Mr. Trapnell's "continuing contribution to the atomic-energy program."

From 1947 until 1952, Mr. Trapnell served as Associate Director of the AEC Division of Information Services, covering both the public and technical information activities of the Commission. In 1946, he was coauthor with Corbin Allardice of the The First Pile, the story of Enrico Fermi's experiment for the first controlled release of nuclear energy.

SYLVANIA ELECTRIC PRODUCTS, INC.,
Bayside, N. Y., February 3, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States,
Washington, D. C.

DEAR MR. ANDERSON: I wish to thank you for your kind invitation to appear before the joint committee early in February to present comments and observations on the policies, programs, and actions of both the Commission and industry subsequent to the enactment, last August, of the Atomic Energy Act of 1954.

From my own point of view, I believe it somewhat preliminary to present to you, at this time, concrete observations as to the effectiveness of the Atomic Energy Act of 1954 in promoting the peacetime uses of atomic energy. As you can appreciate, much of the direction of the atomic-energy program hinges on the prices which the United States Government is willing to pay for fissionable material produced in privately owned reactors. Since the Commission has just recently announced its pricing policy for fissionable materials, it has not yet been possible for me to draw any firm conclusions as to the effect of the prices set by the Commission on the impetus of private development of atomic power.

There are, however, three topics which I should like to mention to you in this letter. The first concerns the demonstration power program which was recently announced by the AEC. As I understand it, in order to expedite the construction and operation of nuclear power reactors in this country, and to hasten the day when nuclear power can be produced at competitive levels, the Commission is offering to provide financial assistance to qualified firms who submit reactor designs and operating plans which best meet the Commission's objectives. I believe that this step on the part of the Commission will do more to implement the intent of the Atomic Energy Act than any other action which could be taken at this time. I say this because it is an excellent method of providing a smooth transition from an atmosphere in which reactors have been completely Government owned and operated to an atmosphere where reactors will become primarily privately financed, built, and operated.

Since the Commission has placed its demonstration power program on a competitive basis, there will be a large incentive on the part of industry to assume as great a share as possible of the financial burden in order to win, competitively, Commission approval under the demonstration program. I believe further that the demonstration power program is one of the most effective means at our disposal of keeping technologically ahead in the worldwide race for the development of peacetime uses of the atom.

Since I am confident that the demonstration program will achieve its objectives after a series of reactors have been sponsored under this program, the need for this type of assistance will ultimately diminish or even completely disappear.

My second point is concerned with the training of scientists and engineers, particularly those from friendly foreign countries. I believe this to be an excellent gesture to demonstrate our willingness and the desire to assist power-short countries in obtaining low-cost, plentiful nuclear power. We, at Sylvania, strongly support this program and have offered assistance in the form of manpower and potential use of our company facilities in helping this program to proceed.

My final comment pertains to the point of ownership of fissionable materials which Mr. S. Roboff of our company made when he testified before the Joint Committee on Atomic Energy on May 17, 1954. The point made at that time was that private ownership of nuclear fuel under Government control and licensing procedures was required to provide the maximum incentives for industrial participation in the atomic-energy program. We fully understand and share the concern of the Government for misuse or mishandling of fissionable materials. However, as we pointed out before, the danger in such misuse of fissionable materials lies in the actual possession of the material rather than in the ownership.

Since, under the rental arrangements for fissionable material which are made possible by the 1954 act, possession of fissionable material will actually be in private hands, the risks to the country in the misuse or misappropriation of fissionable material seem, to me, to be no greater or less than if private ownership of the material were permitted under Government control.

Please let me state that I believe leasing of fissionable material for private use to be a firm step in the right direction. In this connection, I would like a bit more time before arriving at any conclusions as to whether leasing is providing the necessary financial incentives for industry. I would like, with your permission, to present my views to you again on this subject at a later date.

I am not requesting, at this time, an opportunity to testify during the present hearings, for the reasons which I have stated. I believe that when you again hold hearings to determine progress made under the Atomic Energy Act of 1954, and the ways in which it is being implemented, I would like to appear at that time, when I believe I will have been able to arrive at more firm conclusions than have been possible during the short period since last August.

Incidentally, you may include this letter in the open record, as you suggested.

Very truly yours,

SYLVANIA ELECTRIC PRODUCTS, INC.
W. E. KINGSTON,
General Manager,
Atomic Energy Division.

SOUTH CAROLINA ELECTRIC & GAS CO.,
Columbia, S. C., February 2, 1955.

HON. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States,
Senate Office Building, Washington, D. C.

DEAR SENATOR ANDERSON: Thank you for your letter of January 22 by which, on behalf of the committee, you extended to this company an invitation to make such comments and observations as we might have on the "development, growth, and state of the atomic-energy industry."

This company has long been interested in the use of nuclear fuels for industrial purposes, and the participation by it, as well as by other private enterprises in such a program. Since the news release of the Atomic Energy Commission in 1953 announcing the Commission's intention of entering into the production of electric energy on an industrial basis from nuclear fuels, this company has actively attempted to secure in its service area, and participate in the development and operation of, a reactor for the generation of electric energy from such fuel.

On October 27, 1953, we wrote Hon. Kenneth D. Nichols, then General Manager of the Atomic Energy Commission, setting forth the factors which make that area a particularly excellent location for such a plant. Subsequent to this, in December of the same year, we wrote to Adm. H. G. Rickover, then Chief of Naval Reactors Branch, Division of Reactor Development, United States Atomic Energy Commission, restating our interest in the program and making a definitive proposal to him. Subsequent to that time, we conferred with Admiral Rickover and other AEC personnel on this matter.

That particular project was finally placed in the area served by the Duquesne Light Co. We have, however, in numerous ways continued to express our interest in the development of electric generation from nuclear fuels. We here wish to reaffirm that interest and will be glad—indeed, would sincerely like an opportunity—to participate in the program.

We believe that the provisions of the Atomic Energy Act of 1954 will permit private industry to participate to a considerably greater extent in the development and growth of the atomic energy industry than was formerly the case. However, further modifications of the pertinent statutes pertaining to this subject will considerably expand the area in which private enterprise can contribute its capital and talent to this matter which is so vital to our national welfare and safety.

Sincerely,

S. C. MCMEEKIN.

INTERNATIONAL BROTHERHOOD OF FIREMEN AND OILERS,
Philadelphia 7, Pa., February 21, 1955.

Senator CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
United States Senate, Washington, D. C.

DEAR SENATOR ANDERSON: I would like to submit a few remarks concerning atomic energy and members of the International Brotherhood of Firemen and Oilers for the consideration of the Joint Committee on Atomic Energy and for the record.

As an international union, affiliated with the American Federation of Labor, we subscribe to the testimony given before your committee by Mr. Biemiller, member of the A. F. of L. national legislative committee. As an individual organization which, by its very nature, may be deeply affected in the long run by developments in civilian uses of atomic energy we submit these few remarks to magnify by specific example of the importance of Mr. Biemiller's proposal for a statutory Labor-Management Advisory Committee.

The International Brotherhood of Firemen and Oilers has historically represented people engaged in the production of heat and power by conventional means. Developments which tend to affect current techniques of heat and power generation are necessarily of important and far-reaching consequences to our membership whose jobs may some day be affected.

We are aware of the oft-repeated assurances that atomic power facilities will not rapidly displace present installations but that they will only constitute a small part of the increase in power facilities predicted for the near future. It is to be expected that certain types of skilled manpower will be required for even a small atomic growth factor and if special training is required we feel we should be advised in order to prepare our members where possible for any new job opportunities in their field. A Labor-Management Advisory Committee to the Atomic Energy Commission would offer the liaison necessary in a program to provide skilled manpower.

The complexion of this particular problem would seriously change and could become extremely critical for our membership should developments permit reactors of small and compact design to replace present-day giants as, Mr. Holifield noted, some scientists believe will come to pass. Unexpected progress in certain directions conceivably could cause serious job dislocations in our field. In such an event we may be faced with 1 of 2 situations, mass technological unemployment or new and improved job opportunities.

At this point I would like to say that we are not attempting prognostication but want to avoid guesswork entirely by being informed and represented through the proposed Labor-Management Advisory Committee.

Civilian use of atomic energy is bound to have many repercussions on our society, be they mild and gradual or rapid and violent. However, if this change should come we would like to avoid being caught unaware and to prepare to meet, in the full light of day, our future problems and our new opportunities as well.

Sincerely yours,

ANTHONY MATZ.
International President.

STATEMENT OF HENRY NORTON, PRESIDENT, WALTER KIDDE NUCLEAR LABORATORIES, INC. TO JOINT COMMITTEE ON ATOMIC ENERGY, FEBRUARY 10, 1955

In a letter of January 22 to Dr. Karl Cohen, Senator Anderson invited us to attend and testify at the hearings currently being held in accordance with the Atomic Energy Act of 1954 or, if we preferred, to submit a written statement. Under date of January 31, Dr. Cohen wired that we thought a written statement would be sufficient to convey our thoughts at the present time. This statement, in which Dr. Cohen concurs, is as follows:

The Atomic Energy Act of 1954 delineated a new area for the development of atomic power by industry. Since the signing of the act on August 30, 1954, there has elapsed insufficient time for a balanced judgment of its workings. The Atomic Energy Commission has just recently published a list of fuel prices and requested industry to propose power reactor programs by April 1. In the ground rules which the Commission has laid down, there are a number of important factors left undetermined, such as the use and price of Commission facilities for chemical processing of fuel elements and the exact manner in which

AEC research and development assistance will be made available. Possibly material for a judgment of this new program may develop within a few months.

Section 56 of the act of 1954 limits the establishment of guaranteed prices by the AEC to a maximum of 7 years. We believe the minimum practicable amortization period for a nuclear powerplant financed by private capital is 10 years. In addition, it takes about 3 years to design and construct a plant. Thus, the effective useful life for amortization purposes of a 7-year Government commitment is 4 years at the outside. We think this provision should be amended to provide a basis for 10-year amortization of specific plants.

At the present time the implementation of the provisions of the act providing for assistance to foreign countries is still under consideration by the Commission, or at least has not been made known to us. We hope and expect that the Commission will come up with a program which will allow American engineering organizations to compete successfully in foreign markets with their foreign competitors. The steps which are being taken by this country toward the United Nations Conference on Atomic Energy are certainly useful steps, but they do not in themselves constitute an answer to the question of how American industry can participate in the internationalization of the peaceful uses of the atom.

Prior to the passage of the act of 1954, we made strong representations about the necessity for normal patent rights in the atomic energy field, or at least as nearly normal as the overriding demands of national defense would permit. The act of 1954 improved the patent situation over the McMahon Act, but we feel it did not go far enough, and we hope that there will be further revision of the patent section in the direction which we have urged.

Our company intends to make a proposal for an industrial reactor in some region of the United States. A matter which is of some concern to us, and which possibly requires legislative action, is the question of insurance. At the present time the Commission seems to have no authority for assuming disaster risks. On the other hand, many insurance companies have already expressed themselves as being unable to insure against this type of risk, however improbable it may be. We believe that this point has been brought forth by other witnesses, and we shall content ourselves with merely supporting the suggestion that the Government should be authorized to reinsure above a certain minimum risks underwritten by insurance companies on atomic energy installations. This makes good sense inasmuch as the Commission already has the power under section 161, paragraph i, to set standards and restrictions governing the design, location, and operation of atomic facilities to protect health and to minimize danger to life or property.

PENNSYLVANIA POWER & LIGHT CO.,
Allentown, Pa., February 10, 1955.

Senator CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR SENATOR ANDERSON: Referring to our letter of January 28 in reply to yours of January 22, we have followed the reports on the hearings of your committee and do not wish to present a written statement for the record.

In all of our activities, we have had the complete cooperation and have been most favorably impressed by the caliber, sincerity, understanding, and reasonableness of the personnel of the Atomic Energy Commission with whom we have worked. We realized, however, the monumental task of AEC in putting into effect the administrative measures necessary to take full advantage of the provisions of the Atomic Energy Act of 1954, while yet maintaining national security. It is our conviction that the maximum progress in the atomic power industry can be made by the normal free interchange of ideas and discussion of the problems among people properly cleared for atomic power work in the staffs of the manufacturers, utilities, and Commission without restrictions or special dispensations. We believe that the Commission has already taken timely constructive steps to this end and is now engaged to the full extent practical in making dissemination of information adequate to provide the broad base of knowledge necessary to secure development of commercial application of atomic energy.

There are indications that some believe industry is not taking advantage of possibilities based upon the fact that few, if any, proposals for construction have been made. We do not agree. To us, there seems to be a tremendous amount of increased industry activity following the enactment of the 1954 act

and I am sure that you and your committee realize in as unique and untried a development as this where the know-how must first be acquired and where, at the minimum, such large sums of money are involved, many man-hours and months of technical and economic study and research must of necessity be required to make any intelligent proposition. Indeed, even the development of advances in conventional electric generating stations where most of the know-how exists both in the manufacturing and utility industries, many months of such effort are required. Considering the decades required to bring the present methods of producing steam from other natural-resource fuels to their present status, we believe that great progress has been made in the few months since enactment of the Atomic Energy Act of 1954.

Sincerely yours,

CHAS. E. OAKES, *President.*

MONSANTO CHEMICAL CO.,
St. Louis 4, Mo., January 31, 1955.

Senator CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Office Building, Washington 25, D. C.

DEAR SENATOR ANDERSON: Thank you for inviting Charles Allen Thomas, president of Monsanto, and myself to appear before the Joint Committee at its forthcoming hearings on the development, growth, and state of the atomic energy industry.

In view of the fact that we do not feel that what we have to say should occupy the hearing time of the committee, please accept this as our decision not to testify.

However, in accordance with your invitation to submit our views, may I state that Monsanto would like to register its serious concern over section 53e (8) of the Atomic Energy Act of 1954, which provides:

"e. Each license issued pursuant to this section shall contain and be subject to the following conditions—

"(8) the licensee will hold the United States and the Commission harmless from any damages resulting from the use or possession of special nuclear material by the licensee."

In our studied opinion, the mandatory provision quoted above will definitely reduce industry participation in the peacetime applications of atomic energy. With the requirement in the law that such language be included in each license to be issued pursuant to section 53, few, if any, responsible companies will find it advisable to make such an undertaking when the extent of possible damage is so difficult to gage.

We hope the foregoing will be of some interest and use to your committee in its deliberations. If you would like to have us testify or otherwise expand this point of view, let us know.

Sincerely yours,

EDWIN J. PUTZELL, Jr.

NATIONAL ASSOCIATION OF ELECTRIC COMPANIES,
Washington 6, D. C., March 1, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Room F 88, The Capitol, Washington 25, D. C.

DEAR MR. CHAIRMAN: We quote below from a prepared statement filed with your committee yesterday by Mr. Clyde T. Ellis, general manager, National Rural Electric Cooperative Association.

"We also know, according to the expenditure reports filed by Purcell Smith's National Association of Electric Companies, that Bozell & Jacobs, from time to time, has received sums of money from the National Association of Electric Companies for the purchase of publications. We also have heard that Mr. Trapnell is going to head an atomic energy division of Bozell & Jacobs which will be associated with the National Association of Electric Companies here in Washington. We certainly find such developments to be most disturbing, especially in view of the fact that we cannot even get proper representation of the farmers' rural electric systems on the AEC's public advisory committees."

We do not know whether Mr. Ellis touched on this in his oral testimony and if so, whether or not it differed from the above.

We address ourselves particularly to the second sentence:

"We also have heard that Mr. Trapnell is going to head an atomic energy division of Bozell & Jacobs which will be associated with the National Association of Electric Companies here in Washington."

This rumor which is contained in Mr. Ellis' statement is not correct. The National Association of Electric Companies pays no fees whatsoever to Bozell & Jacobs nor to the electric companies public information program, and there is no intention, expressed or implied, that Mr. Trapnell or Bozell & Jacobs have been or are to be associated with the National Association of Electric Companies.

Many of the companies that are members of the National Association of Electric Companies are also members of the electric companies public information program and occasionally, to avoid duplication, there is a joint communication sent out to the members of both organizations signed by a head of both organizations.

The sums paid by the National Association of Electric Companies to Bozell & Jacobs for purchase of publications have amounted to approximately $20 since the inception of the National Association of Electric Companies in August 1945. This is only a trifle compared to our total expenditures for many and varied publications.

This letter is directed to a single paragraph of Mr. Ellis' statement as quoted above. It does not in the least imply concurrence with the balance of Mr. Ellis' statement. The views of the National Association of Electric Companies and the electric companies public information program very naturally, because of many common member companies, coincide in practically every particular. We write this letter solely because of the hearings being conducted by your committee with respect to the Atomic Energy Act of 1954 and its administration by the Atomic Energy Commission. We do not propose to use this forum, unless so desired by your committee, for a comprehensive general discussion of the many factors having to do with the activities of several departments and agencies of the Federal Government in connection with operation of electric power generating and other facilities which have relationship to several Federal laws other than the Atomic Energy Act.

We would greatly appreciate your having this letter reproduced in the printed record following the testimony of Mr. Ellis.

For the convenience of the committee, we are sending a copy hereof to each member of the committee and its executive director.

Sincerely,

P. L. SMITH.

PARK FOREST, ILL., *February 10, 1955.*

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR SENATOR ANDERSON: I wish to apologize, for the Federation of American Scientists, for the delay in answering your invitation to present comments and observations on the policies, programs, and actions of the Atomic Energy Commission and American industry. This delay is due to the apparatus of our federation, which, in order to preserve a deliberative attitude, requires a clearance of all committee statements through our executive committee; and also to the location of the FAS committee on atomic energy legislation and nuclear power at Chicago, so that all communication with our executive committee and our Washington office must be by mail.

Our Committee has recently begun a study on the actual involvement of industry in nuclear power development, in terms of the investment of funds, unrecoverable from AEC contracts, which has been made. We are also concerned with assessing progress in nuclear development, with emphasis on the long-range future of the United States in what we assume will be an internationally competitive nuclear power industry. Unfortunately, these studies are not at the moment sufficiently advanced for us to be able to predict a policy statement during the time set for Joint Committee hearings. From time to time, we hope to issue information bulletins which we will be pleased to bring to your attention, with the understanding that such bulletins are not official statements of the Federation of American Scientists, but merely represent temporary conclusions of our committee.

Our committee is also the organ of the FAS which examines the pubished operations of the AEC with reference to its role as primary agent in developing nuclear power. In this regard, we have followed the Dixon-Yates controversy, and have made recommendations embodied in the enclosed statement of the federation, which I am authorized to submit for inclusion in the open record of the Joint Committee on Atomic Energy.

W would like to take this opportunity to thank the Joint Committee on Atomic Energy for its invitation to testify, and hope that in the future we will be better prepared to accept such an invitation. Needless to say, material presented during such hearings is a major source of our information and we will, therefore, be following them with close interest.

Very truly yours,

BERNARD I. SPINRAD,
Chairman, FAS Committee on Atomic Energy and Nuclear Power.

FEDERATION OF AMERICAN SCIENTISTS,
Washington 6, D. C.

SCIENTISTS' GROUP DEPLORES POLITICAL INVOLVEMENT OF AEC

The executive committee of the Federation of American Scientists, meeting December 4 in New York City, issued the following statement in response to the direction of the FAS national council, which met in Chicago on Saturday, November 27, 1954:

"The Federation of American Scientists is gratified by the nomination of two distinguished scientists, Dr. Willard F. Libby and Dr. John Von Neumann, to membership in the Atomic Energy Commission, and is encouraged that Dr. Libby has already been confirmed on a nonpolitical, nonpartisan basis. We are happy that the initial partisan objection to his confirmation has been withdrawn.

"It is most unfortunate that the AEC has become deeply involved in political controversy in recent months. While the relation of public and private power agencies in this country is an issue which must be resolved by the traditional American procedure of public debate, this issue should not have been injected into the AEC's operations by the administration and the Congress. By accepting the Dixon-Yates contract as lying within their sphere of action, the AEC Commissioners have created confusion in the public mind regarding the true purposes of the AEC and have diminished the confidence of the Congress in the AEC's nonpartisan status.

"We urge that the administration, the Congress, and the Commission undertake to keep the AEC out of further irrelevant controversy and to channel its activities clearly back into its vital and nonpolitical task of developing atomic energy in the national interest."

Prof. M. Stanley Livingston (physics department, MIT), chairman of FAS, presided at the federation's executive committee meeting December 4, in New York. The FAS is a national organization of scientists and engineers of all fields, who are concerned with the interaction of science and public affairs. It was formed in 1946, and has a membership of some 1,500. Other members of the executive committee participating in the FAS meeting, which concerned itself with a number of issues of current concern to the scientist-citizen, were: Alden B. Bestul, chemist, Washington, D. C.; W. A. Higinbotham, physicist, Upton, N. Y.; David L. Hill, theoretical physicist, Los Alamos, N. Mex.; Herbert C. Pollock, research physicist, Schenectady, N. Y.; and Arthur S. Wightman, physicist, Princeton, N. J.

ATOMIC INDUSTRIAL FORUM, INC.,
New York, N. Y., January 28, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
United States Atomic Energy Commission,
Washington, D. C.

DEAR CHAIRMAN ANDERSON: Thank you very much for your letter of January 22 inviting the Atomic Industrial Forum to make such comments and observations as we may have on the policies, programs, and actions of the Atomic Energy Commission and industry during the hearings to be held by the Joint Congressional Committee on Atomic Energy from January 31 to February 11, 1955.

We regret that we must decline your kind invitation for the time being. Perhaps, however, if the hearings to which you refer are continued into March we may have some factual data of pertinence and interest to offer as an aid to the committee in its deliberations concerning the growth and development of the atomic energy industry.

We should like to take this opportunity to say that we are very much impressed with the need and desirability for the hearings which you plan and which are called for by the Atomic Energy Act of 1954. It is our considered thought that, while it is important for those who are close to atomic-energy development to look deeply into the problems of the moment, the American Government and public should never lose sight of the overall need and desirability of continuously reporting as openly as possible the information associated with present and future progress in the atomic-energy field. Hearings, especially open hearings, by the Joint Committee are an enormously useful means of accomplishing this vital objective.

Please let us also say that if there is at any time a specific survey or study which your committee may wish to have done, or a specific piece of factual information about the atomic-energy industry which you may wish to have provided to you, we should be most pleased to attempt to secure it.

We are, of course, deeply appreciative of your invitation to testify and shall be most happy to be advised in advance of future hearings to be held by the committee.

Sincerely,

CHARLES ROBBINS,
Executive Manager.

TENNESSEE VALLEY AUTHORITY,
Knoxville, Tenn., February 1, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Office Building, Washington, D. C.

DEAR SENATOR ANDERSON: This will acknowledge with thanks your letter of January 22 inviting comments on the policies, programs, and actions of the Atomic Energy Commission and the atomic-energy industry for purposes of the review which the Joint Committee on Atomic Energy is undertaking pursuant to section 202 of the Atomic Energy Act of 1954.

The Tennessee Valley Authority has an intense interest in the atomic-energy field both because AEC is by far the largest consumer of TVA power and because of the promise that nuclear fuels hold for the future in the production of electric power. As you may know, in November 1953 TVA entered into an agreement with AEC under which TVA has undertaken studies of the methods and feasibility of electricity production from nuclear energy. The agreement, for 1 year, has been renewed for a second year ending next November. Under this agreement a number of TVA staff members have been assigned to various installations and laboratories of AEC and its contractors. The TVA Board feels that TVA and AEC as sister agencies have much to gain from continued and expanded arrangements for collaboration.

We are pleased to see the experimental reactor work being pressed with increasing energy. We believe that public power agencies—and TVA in particular, because of the size and location of its system and its existing relationships with AEC—should plan to assist increasingly in this program, which we believe to be in the public interest.

We are not requesting an opportunity to testify at the hearings which have been set by the Joint Committee. However, we will of course, be very happy to make available to the Joint Committee any information which we have and which the committee may desire.

Sincerely,

HERBERT D. VOGEL,
Chairman of the Board.

NEW ENGLAND ELECTRIC SYSTEM,
Boston, Mass., February 9, 1955.

HON. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Capitol Building, Washington, D. C.

DEAR SENATOR ANDERSON: In accordance with my telegram of January 31, there are enclosed 25 copies of a brief statement on behalf of Yankee Atomic Electric Co. and the New England utilities associated with us in this enterprise.

Very truly yours,

WILLIAM WEBSTER,
President, Yankee Atomic Electric Co.

To the Joint Committee on Atomic Energy:

The following statement of views is submitted on behalf of Yankee Atomic Electric Co., with the request that it be included in the record of the 1955 hearings conducted by your committee pursuant to section 202 of the Atomic Energy Act of 1954.

Yankee Atomic Electric Co.

Yankee Atomic Electric Co. is a recently formed Massachusetts corporation sponsored by a group of New England utilities responsible for about 90 percent of the electric supply of the region. Our objective is the early installation of a commercial-scale atomic powerplant in New England. We hope through our joint efforts to be able to proceed more rapidly than any one of us could do alone.

Atomic power in New England

New England is particularly suitable for an early experiment in the use of power developed from a commercial-scale atomic reactor. The six-State area is fully interconnected by existing transmission lines, and our utility companies have had long experience in the interchange of power between their individual systems. As a result, there is a broad base which can readily absorb the uncertain power output of an experimental atomic powerplant without undue risk of imbalance.

More importantly, New England has no natural deposists of coal or oil, and must import its requirements of these fuels, resulting in relatively higher fuel costs in its conventional thermal plants. For that reason, we feel a particular urgency to assist in the necessary next step toward the development of economically competitive atomic power. This step, we believe, is the construction and actual operation of commercial-scale generating plants by several utilities throughout the country, to permit the elaboration and refinement of the technical advances already achieved by the Commission in its series of experimental reactors.

New England is also rich in the engineering skill and the technical industrial know-how necessary for the successful development of such a pioneer plant, and we are confident that we will have full and able support for our venture in this respect. In addition, we believe that the early installation of an atomic powerplant will have an important stimulating effect in the New England industries most closely connected with the broader development of peacetime uses of atomic energy.

Progress to date

Since the formation of our group in September 1954, our principal efforts have been devoted to evaluating the various types of atomic reactors suitable for early installation in a commercial-scale plant. Our objective has been to develop a program which will utilize the most advanced type of reactor currently available and holding the greatest promise of producing commercially competitive power—power that is within a reasonable range of being competitive with the output of a conventional thermal plant, both as to reliability of operation and from the point of view of cost per kilowatt-hour.

To obtain the necessary data with respect to existing reactor designs and possibilities, we have had numerous conferences with members of the Commission's staff throughout this period. In addition, we have sought the advice of independent consultants and industrial firms having a detailed knowledge of the specialized problems involved in the various alternative designs available for our purposes. Most important of these contacts has been a working arrangement of several months' standing with one of the major chemical companies.

On the basis of the information thus available, we have attempted to work out in detail the financial and economic aspects of the various possible alternatives.

Any such estimates are necessarily studded with uncertainties. Nevertheless, we believe we have made progress toward our ultimate objective. As a result, we hope to be able to submit a feasible proposal to the Commission for consideration in its recently announced power demonstration reactor program.

During this period we have also completed the organization of Yankee Atomic Electric Co. under Massachusetts laws, and the 11 sponsoring utilities have subscribed to an initial issue of stock of $317,500 to provide funds for the preliminary work already in progress. Approval of this initial stock issue has already been granted by the Massachusetts Department of Public Utilities, and an application for approval is now pending before the Securities and Exchange Commission under the Public Utility Holding Company Act of 1935..

The role of the utility industry

The utility industry has a vital role to play in the development of atomic power. We feel a particular responsibility to be in the forefront of this important new development which holds great promise for the future of the electric industry. At the same time, we must work within the framework of what has traditionally been a regulated industry. For that reason, we are also keenly aware of a corresponding responsibility to our consumers and investors, which requires an extra measure of care on our part in approaching any new undertaking such as this.

The underlying philosophy of the Atomic Energy Act of 1954 is to throw open the whole field of peacetime uses of atomic energy for development by American industry. Important emphasis has been placed, and rightly so, on the early development of economically competitive power. This program involves the efforts of a large segment of the industrial community in addition to the utility industry itself; fabricators, suppliers, chemical companies, users of radioactive byproducts, and so on down the list. But the crucial fact, and perhaps the basic reason why progress to date has seemed slow and undramatic, is that the whole parade must necessarily wait on the regulated utility industry to take the first step in going ahead with the construction and operation of an atomic powerplant, in which these other associated industries will participate. In a sense, we will achieve an important breakthrough when the first considerable number of utility companies find their way clear to undertake actual construction of commercial-scale atomic powerplants. Once this initial step has been taken, we believe that further progress will come along at an increasing tempo.

We are confident that this development will come about, and are conscious of the pressure on the utility industry, including our own group of companies, to take the necessary first step as soon as possible. Our progress will be hastened by any measures which will help to define, and if possible to reduce, the risks and uncertainties to be assumed by the utility companies.

Insurance

We wish to emphasize what has already been dwelt upon at length by other participants in these hearings: the problem of public liability in the operation of a full-scale atomic reactor.

It is virtually impossible for any concern to risk its entire assets in self-insurance against a possible atomic disaster, however improbable such an event may be. For a utility company to do so would in effect endanger its ability to continue to render normal service to the consumers who are dependent upon it. Our own inquiries have indicated that assumption of the full measure of the catastrophe risk involved poses an almost insoluble problem for the insurance industry at the present time. While we are confident that with the accumulation of further experience these risks can be assimilated into the regular pattern of insurance coverage, we feel that during an interim period some sharing or reinsuring of these risks must be undertaken by the Federal Government. Since this problem lies athwart any real progress toward the development of a power reactor program, we cannot urge too strongly the need for a prompt solution.

Prices and availability of special nuclear materials

One of the major problems in any financial study of a proposed reactor is the question of future prices of special nuclear material, both for the input and the output of the reactor. For this purpose, the probable trend of prices must be projected with a reasonable degree of certainty over a minimum period corresponding to the amortization period of any senior financing.

The prices and charges which will apply to the input of the reactor are to be determined by the Commission in accordance with the requirements of section 53 of the act. While the current price of such materials will be known, un-

certainty as to future prices is inevitable unless the Commission is given power to guarantee that such prices will not exceed an appropriate maximum over a reasonable period in the future.

The prices which will apply to the output of the reactor have now been clarified, to the extent possible under the act, by the Commission's announcement of guaranteed prices which will hold good for the next 7 years, as permitted by section 56 of the act. However, from the point of view of a company formulating a proposal at the present time, a preliminary period of design and construction will run from 2 to 3 years even on the most optimistic estimates. A further period of intermittent operation will then be required to allow for testing and shakedown operations. As a result, the guaranteed prices thus far announced can be counted on only for that part of the 7-year period that remains after commercial operation is attained. This could not be over 4 years, and might well be less. While we recognize that it may not be desirable to extend the Commission's power to guarantee prices in all cases, we believe a major uncertainty would be resolved if a longer period of guaranteed prices were available for demonstration reactors terminating with a finding of practical practical value under section 102 of the act.

A related problem concerns the availability of the special nuclear materials necessary to assure the continued operation of a reactor throughout its normal useful life. Unlike a facility license under section 103, which may be granted for a term of up to 40 years, there is no fixed term prescribed in the act for the companion license under section 53 which authorizes the receipt and use of special nuclear materials. In addition, the act contemplates an annual allocation procedure which raises further uncertainties, since realistically any company which contemplates the construction of a pioneer plant must face the possibility of becoming a marginal user of special nuclear material as new advances in reactor design and operation are incorporated into later installations.

Modification of licenses

Section 187 provides that any license shall be subject to modification by reason of any future rule or regulation issued by the Commission. Read in conjunction with the specific causes for revocation set forth in section 186, it is apparent that modification of a license to conform to Commission regulations was regarded as wholly distinct from outright revocation. Nevertheless, the necessary broad scope of the Commission's rulemaking powers suggests the possibility that a license granted today may be virtually emasculated by regulations promulgated 10 years in the future, to deal with problems which are now wholly unforeseen.

Commission regulations

Many uncertainties which exist today will be geratly clarified as the Commission's practice is crystallized and regulations are developed. An example of immediate importance involves the question of safety regulations, since requirements as to the extent of shielding, containment, exclusion area and other construction details may result in considerable upward revisions in cost estimates now being developed.

A separate problem which we hope will be clarified by the Commission's regulations and practice involves the operation of the security clearance system, and the extent to which a horizontal flow of information will be permitted to take place beween properly cleared individuals. We believe it is vital to reestablish the normal direct relationship of equipment producers, suppliers, and processors with their utility clients, without requiring the Commission and its staff to act as intermediaries. Only in this way can full advantage be taken of normal industrial channels and the competitive forces of American industry.

Conclusion

The New England utilities which have sponsored Yankee Atomic Electric Co. are vitally interested in pressing forward toward the ultimate goal of economically competitive atomic power. We feel a particular responsibility to participate in what we regard as the necessary next step in the national program, the elaboration on a commercial scale of the experimental findings already achieved by the Commisison. Our efforts to date have convinced us that the time is now ripe for this important development, and we intend to devote our full energies to the task of working out the details of the most promising program we can devise.

WILLIAM WEBSTER,
President, Yankee Atomic Electric Co.

APPENDIX B

B–1

(Referred to on pp. 195 and 198 of pt. 1)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington 25, D. C., February 24, 1955.

HON. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: At the recent hearings held pursuant to section 202 of the Atomic Energy Act of 1954, the Commission was requested to submit the following information regarding patents:

1. An analysis of the patents that are now owned by the Commission, including an analysis of how many of the patents owned relate to the direct techniques involved in the utilization of atomic energy or the production of special nuclear material.

2. The terms of the 390 nonexclusive licenses that have been issued.

3. Information as to whether standard specifications for the issuance of patent licenses have been set up by the Commission pursuant to section 156 and whether such specifications have been issued and published.

4. Information as to whether the Commission at one time required in applications for isotopes that the users grant the Commission the right to take patents on inventions discovered from their use.

5. Information as to whether the radioisotope field "really blossomed forth" as soon as patent requirements were removed.

Attachment A is a list of patents owned by the Commission classified according to their principal field of use. Inventions used solely in the production of special nuclear material have been patentable only since August 30, 1954. Accordingly, no patents have been issued to the Commission in this field. Further, inventions relating directly to the production or utilization of special nuclear material are held under secrecy order by reason of classification and patents will not issue on such inventions in the future until their subject matter is declassified.

Attachment B is a copy of the form of nonexclusive patents license which was utilized by the Commission under the 1946 act and attachment C is a copy of the form of license now used under the 1954 act.

On December 28, 1949, the Commission issued a press release describing its program for licensing patents on inventions held by the Commission. A copy of this release is attached as attachment D. Under the 1946 act, applicants for a license were not required to meet any established specifications beyond identifying the subject matter of the patent by patent number and title. The standard specifications now required under section 156 of the 1954 act are in process of preparation.

I have been advised that at no time has the Commission required applicants for isotopes to accord the Government any rights to inventions made as a result of the use of isotopes. You will therefore appreciate that one cannot conclude that the radioisotope field "really blossomed forth" when patent requirements were removed. It should be noted moreover that, under the 1946 act, normal patent rights and procedures applied to inventions in the field of utilization of isotopes, other than for military weapons.

Sincerely yours,

K. D. NICHOLS, *General Manager.*

[Attachment A]

PATENTS OWNED BY THE COMMISSION

PRINCIPAL FIELD OF THE INVENTION	*Number in said field*
I. Testing and measuring procedures and devices useful in industry:	
(1) General procedures and devices—thermal flowmeters, corrosion testing, calibrating, thermocouples, pressure monitors, etc	48

	Number in said field
I. Testing and measuring procedures, etc.—Continued	
(2) General apparatus and equipment of specific design—balances, pipettes, stopcocks, seals, receptacles, sampling apparatus, etc	28
(3) Radiographic techniques and apparatus	7
II. Mechanical and metallurgical:	
(1) General mechanical equipment—reamers, couplings, supports, brushes, drill tools, chronographs, etc	35
(2) Pumps and pumping systems—mechanical, electromagnetic, vapor diffusion, etc	14
(3) Valves—needles, diaphragm, packless, quick operating, etc	11
(4) Remote control manipulators	7
(5) Welding methods and apparatus	4
III. Particle accelerators, electromagnetic isotope separators, mass spectrometers, and associated equipment:	
(1) Particle accelerators—cyclotrons, synchrocyclotrons, electrostatic generators, and related equipment	28
(2) Mass spectrometers—electromagnetic separators and related equipment	25
(3) Ion sources and generators	25
(4) Magnetic flux indicating and measuring devices and systems	10
(5) Vacuum analyzers, leak detectors, etc	7
(6) Ion gages and systems for measuring low pressures	11
IV. Radiation detecting and measuring devices and systems:	
(1) Proportional counters, Geiger-Muller counters, ionization chambers, fission chambers, alpha particle detectors, and related equipment	52
(2) Radiation pocket meters, hand and foot counters, dosimeters, survey instruments, etc	35
(3) Neutron detecting devices, systems and dosimeters	23
V. General electrical and electronic circuits and equipment:	
(1) Circuits—amplifiers, power supplies, voltage regulators, integrating networks, pulse generators, electronic analyzers, coincidence circuits, etc	99
(2) Devices—resistors, switches, insulators, vacuum tubes, condensers, transformers, filters, etc	30
VI. General chemical or radiochemical processes, methods, compositions, and related equipment:	
(1) Uranium oxides and carbides—preparation and uses	12
(2) Uranium hydrides and deuterides—preparation and uses	9
(3) Uranium halides—preparation and uses	20
(4) Uranium ore treatment processes, alloys, organic derivatives, etc	16
(5) Neptunium, plutonium, and other transuranic elements—compositions and methods of separating and purifying	11
(6) Beryllium and its compositions—preparation and uses	9
(7) Boron and its compositions—preparation and uses	15
(8) Fluorine—production, purification, uses, and related procedures and materials	19
(9) Fluorocarbon compositions—methods of production, purification, stabilizing, and uses	38
(10) Heavy water—methods of preparation, purification, recovery, and related equipment	7
(11) Radioactive isotopes—methods of preparation, purification, separation, and uses	10
(12) Thorium and rare earths—compositions—production and uses	7
(13) Zirconium and its compositions—preparation and uses	9
(14) General chemical processing methods and related equipment—precipitation, distillation, dissolution, filtration, decontamination, etc	43
(15) Miscellaneous general compositions—crucibles, joint fillers, alloys, etc	12
(16) Various organic compositions—preparation and uses	11

Form AEC-185
(8-50)

[Attachment B]

U. S. ATOMIC ENERGY COMMISSION LICENSE AGREEMENT

The UNITED STATES GOVERNMENT, as represented by the UNITED STATES ATOMIC ENERGY COMMISSION (hereinafter referred to as the "COMMISSION"), hereby grants to the _____, a corporation organized and existing under and by virtue of the laws of the State of _____ (and hereinafter referred to as the "LICENSEE"), a nontransferable, nonexclusive, revocable, royalty-free license to manufacture, use, and sell any article or material, and to use any method or process, in the practice of any and all inventions covered by each application and patent listed in Schedule A attached hereto, and any and all patents which may issue on any said application.

The LICENSEE is hereby authorized to obtain from the U. S. Patent Office, at the LICENSEE's expense, a copy of the drawings and specifications of each application for patent licensed hereunder.

The COMMISSION makes no representation or warranty that exercise of this License will not result in the infringement of any other patents, nor does the COMMISSION assume any liability resulting from the exercise of this License by the LICENSEE.

This License does not constitute the granting of any authorization under Sections 4, 5, 6, 7 or any other Section of the Atomic Energy Act of 1946 (42 U. S. C. 1801) for which separate application for a license or authorization must be made in accordance with the Statute or the COMMISSION's regulations.

GOVERNMENT OF THE UNITED STATES,
UNITED STATES ATOMIC ENERGY COMMISSION,
By _____
Chief, Patent Branch.

Washington, D. C.
———, 195–.

SCHEDULE A

U. S. Patent No.:
Title:
Inventor:
Date issued:
Assignee: Government of the United States as represented by the U. S. Atomic Energy Commission.

[Attachment C]

U. S. ATOMIC ENERGY COMMISSION

LICENSE AGREEMENT

The UNITED STATES GOVERNMENT, as represented by the UNITED STATES ATOMIC ENERGY COMMISSION (hereinafter referred to as the "COMMISSION"), hereby grants to _____, a corporation organized and existing under and by virtue of the laws of the State of _____ (and hereinafter referred to as the "LICENSEE"), a nontransferable, nonexclusive, revokable, royalty-free license to manufacture, use, and sell any article or material, and to use any method or process in the practice of any and all inventions covered by each application and patent listed in Schedule "A" attached hereto, and any and all patents which may issue on any said application.

The LICENSEE is hereby authorized to obtain from the U. S. Patent Office, at the LICENSEE's expense, a copy of the drawings and specifications of each application for patent licensed hereunder.

The COMMISSION makes no representation or warranty that exercise of this License will not result in the infringement of any other patents, nor does the COMMISSION assume any liability resulting from the exercise of this License by the LICENSEE.

This License does not constitute the granting of any authorization under Chapters 4, 5, 6, 7, 8, and 10, or any other Chapter or Section of the Atomic Energy Act of 1954 (42 U. S. C., Sections 2011–2296) for which separate applica-

tion for a license or authorization must be made in accordance with the Statute or the COMMISSION'S regulations.

GOVERNMENT OF THE UNITED STATES,
UNITED STATES ATOMIC ENERGY COMMISSION,
By _____
Chief, Patent Branch.

Washington, D. C.
———, 195–.

SCHEDULE A

U. S. Patent No:
Title:
Inventor:
Date issued:
Assignee: Government of the United States as represented by the U. S. Atomic Energy Commission.

UNITED STATES ATOMIC ENERGY COMMISSION

Washington 25, D. C.

For press and radio, No. 244 tel. ST. 8000, brs. 307, 308.
For release at conclusion of AEC press conference scheduled to begin at 3:00 p. m., December 28, 1949.

SIXTY-SEVEN PATENTS HELD BY ATOMIC ENERGY COMMISSION ARE RELEASED FOR PUBLIC USE

Descriptions of 67 patents owned by the U. S. Government and held by the Atomic Energy Commission have been transmitted to the U. S. Patent Office for registry and listing in the Official Register of Patents Available for Sale.

The descriptions were contained in a letter from Carroll L. Wilson, General Manager of the AEC, to T. T. Reynolds, Register of Patents. The transmittal was part of the Commission's program to make nonsecret technological information available for use by industry.

Mr. Wilson's letter stated that the Commission proposes to grant nonexclusive, royalty-free licenses on the listed patents and requested that abstracts of the patents, listed by number and title, be prepared for publication in the U. S. Patent Office Official Gazette, together with appropriate notice of the availability of such patents for license.

This action of the AEC is in accord with the unanimous recommendation of the Commission Patent Advisory Panel that there be adopted a program of granting royalty-free, nonexclusive license to citizens on all inventions held by the AEC and which are not required for security reasons to remain classified. This program broadens a previous policy, initiated in 1946 by the Office of Scientific Research and Development and subsequently adopted by the AEC, of granting patent licenses only in the field of atomic energy instruments. The advisory panel consists of: William H. Davis of Davis, Hoxie & Faithfull, New York, N. Y.; Casper W. Ooms of Dawson, Ooms, Booth & Spangenberg, Chicago, Ill.; John W. Dienner of Brown, Jackson, Boettcher & Dienner, Chicago, Ill.; of granting patent licenses only in the field of atomic-energy instruments. The Hector M. Holmes of Fish, Richardson & Neave, Boston, Mass.; and H. Thomas Austern of Covington, Burling, Rublee, O'Brian & Shorb, Washington, D. C.

In the field of atomic energy and related fields, the AEC has acquired title to a large number of inventions made in the course of the work under its contracts and the contracts of its predecessor, the Manhattan Engineer District. Most of these inventions and applications for patents upon them are held secret. However, from time to time, inventions and applications for patents are to be made public, with due regard for national security, in accord with the declassification procedures of the Commission.

Under the Atomic Energy Act, the Commission has responsibility for disseminating unclassified information to further scientific progress, and the enlargement of the scope of this program for licensing patents on inventions developed with public funds is regarded by the AEC as a step in conformance with the statutory directive.

Patents included in the first listing (full list attached hereto) sent to the Patent Office are representative of inventions at SAM Laboratories, Columbia University; Argonne National Laboratory (formerly Metallurgical Laboratory),

University of Chicago; Oak Ridge National Laboratory, (formerly Clinton National Laboratory), Oak Ridge, Tenn.; Radiation Laboratory, University of California, and other AEC contractors such as Iowa State College, Ames, Iowa; Massachusetts Institute of Technology, Cambridge, Mass.; University of Minnesota, Minneapolis, Minn.; Ohio State Research Foundation, Columbus, Ohio; E. I. du Pont de Nemours Company, Inc., etc.

Patents owned by the U. S. Government, as represented by the U. S. Atomic Energy Commission, available for license

Patent No.	Title	Date of issue
2,410,384	Furnace Control System	Oct. 29, 1946
2,417,392	Torsion Balance	Mar. 11, 1947
2,418,523	Method and Apparatus for Producing Radiographs	Apr. 8, 1947
2,419,915	Apparatus for the Storage of Fluorine	Apr. 29, 1947
2,421,649	Method of Welding or Cutting Metal by Hydrogen-Fluorine Flame	June 3, 1947
2,422,590	Production of Fluorine	June 17, 1947
2,422,907	Purification of Acid Potassium Fluorides	June 24, 1947
2,422,921	Adjustable Capillary Leak	Do.
2,423,173	Safety Pipette	July 1, 1947
2,431,905	Quick Locking Furnace Base Plate	Dec. 2, 1947
2,431,969	Fluorination of Perchlorohexatriene	Do.
2,431,975	Method of Welding Carbon to Molybdenum	Do.
2,436,083	Sedimentation Tube	Feb. 17, 1948
2,436,084	Ionization Chamber	Do.
2,437,476	Differential Twin Chamber Neutron Meter	Mar. 9, 1948
2,440,167	Differential Ion Chamber	Apr. 20, 1948
2,440,999	Compressed Neutron Source	May 4, 1948
2,442,314	Geiger Counter Improvement	May 25, 1948
2,442,589	Purification of Perfluoroheptane by Azeotropic Distillation with Methyl Ethyl Ketone	June 1, 1948
2,442,599	Glass Magnetic Stopcock	Do.
2,442,622	Seal	Do.
2,443,365	Support for Geiger-Mueller Counters	June 15, 1948
2,444,613	Low Humidity Meter	July 6, 1948
2,446,251	Joint Fillers	Aug. 3, 1948
2,446,780	Method of Preparing Uranium Hydride	Aug. 10, 1948
2,446,997	Molecular Distillation Process	Aug. 17, 1948
2,448,479	Uranium Monocarbide and Method of Preparation	Aug. 31, 1948
2,451,953	Meter Protection Circuit	Oct. 19, 1948
2,452,139	Method of Preparing Uranium Deuteride	Oct. 26, 1948
2,452,156	Float Position Indicator	Do.
2,452,913	Method of Producing Calcium Hydrides by Distillation	Nov. 2, 1948
2,455,718	Direct Current Amplifier	Dec. 7, 1948
2,456,426	Mass Spectrometer System	Dec. 14, 1948
2,458,632	Ionization Chamber	Jan. 11, 1949
2,461,661	Preparation of Alkali Metal Compounds	Feb. 15, 1949
2,461,662	do	Do.
2,461,663	Preparation of Alkali Metal Borohydrides	Do.
2,462,935	High Stability Voltage Regulator	Mar. 1, 1949
2,462,997	Attachment for Milling Machines	Do.
2,465,886	Electrical Measuring Apparatus	Mar. 29, 1949
2,465,938	Radiation Measuring Device	Do.
2,468,678	Regulator	Apr. 26, 1949
2,468,681	Purification of Hydrogen Fluoride	Do.
2,469,916	Process of Producing Uranium Tetrabromide	May 10, 1949
2,470,895	Impulse Type Power Supply	May 24, 1949
2,472,365	Alpha Particle Counting	June 7, 1949
2,472,456	Crucible and Method of Making Crucibles	Do.
2,474,773	Radiation Detector	June 28, 1949
2,474,042	Vibration Eliminating Apparatus	June 21, 1949
2,475,138	Device for Measuring Thermal Conductivity	July 5, 1949
2,477,924	Method of Preparing Uranium Trioxide	Aug. 2, 1949
2,479,271	Ionization Chamber Circuit	Aug. 16, 1949
2,479,600	Ionization Chamber	Aug. 23, 1949
2,479,699	Apparatus for Magnetic Measurements	Do.
2,481,320	Magnetic Pump	Sept. 6, 1949
2,481,506	Fast Neutron Meter	Sept. 13, 1949
2,481,964	do	Do.
2,483,981	Dynamic Condenser	Oct. 4, 1949
2,483,991	Radiation Exposure Meter	Do.
2,485,469	Method and Means for Detecting Ionization	Oct. 18, 1949
2,485,470	Method and Apparatus for Control of Beam Energy	Do.
2,485,507	Chlorinated Hydrocarbon	Do.
2,485,516	Shallow Plane Proportional Counter	Do.
2,486,207	Liquid Level Measuring Apparatus	Oct. 25, 1949
2,486,955	Producing Thin Film of Metal Oxide	Nov. 1, 1949
2,487,360	Nitrogen Purification Process	Nov. 8, 1949
2,487,510	Current Integrating Network	Do.

B–2

(The material referred to on p. 223 of pt. 1 appears beginning on p. 269 of pt. 2.)

(The material referred to on p. 148 of pt. 1 was previously inserted in the record and appears on p. 91 of pt. 1.)

B–3

(Referred to on p. 305 of pt. 2.)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C., February 11, 1955.

Mr. CORBIN ALLARDICE,
Executive Director, Joint Committee on Atomic Energy.

DEAR CORBIN: The attached is forwarded for enclosure in the record of yesterday's testimony. I believe that it was expected that I would supply it. It is the statement of the Secretariat concerning those meetings since November 11 at which there had been discussion of the Dixon-Yates contract and the extent of such discussion.

Sincerely yours,

L. S.
LEWIS L. STRAUSS.

REPORT FROM SECRETARIAT SHOWING ESTIMATED TIME TAKEN UP BY MVGC CONTRACT DISCUSSION AT COMMISSION MEETINGS NOVEMBER 11, 1954, TO PRESENT TIME

November 11, 1954, meeting 1041.—The General Manager reported that the modifications discussed at meeting 1040 had been accepted by the company and, therefore, in accordance with the Commisison decision at meeting 1040 all the documents had been signed. The General Counsel said that he was satisfied that the documents had been properly executed. The Commission then considered and approved a proposed press release. Time—40 minutes plus an informal meeting with Messrs. Dixon and Yates (formal meeting began 11:30 a. m. and concluded at 12:10 p. m.).

November 16, 1954, meeting 1042.—The General Manager reported that the Senate Antimonopoly Subcommittee had requested copies of all AEC power contracts and the Commission indicated that there was no objection to transmitting this information. The MVGC contract was not specifically discussed at this meeting. Time—less than 5 minutes (no transcript; however, the item was only reported).

November 17, 1954, meeting 1043.—The General Manager reported that MVGC had filed an application to the SEC for permission to issue securities. Time—less than 5 minutes (1 page of the transcript).

January 28, 1955, informal meeting of Commissioners Strauss and Libby.—There was discussion of the resolution of the MVGC contract which was then pending before the JCAE. In particular, the rights of the parties to terminate and the effect of a termination on AEC operations was discussed. Estimate of time—15 minutes (transcript pp. 16–27; 12 pages).[1]

February 1, 1955, meeting 1058.—The General Counsel reported to the Commission on the effect of the Joint Committee resolution and related matters: 30 minutes.

Reading of account of Senator Gore's telegram, and laying over of Mr. Murray's substitute motion: 5 minutes. (Time estimated from transcript.)

February 5, 1955, meeting 1059.—Discussion of Senator Gore's telegram and action on it: 30 minutes. (Time estimated from transcript.)

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[1] Based on the assumption that 40 pages of the transcript represents an hour's discussion.

B–4

(Referred to on p. 374, pt. 2.)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington 25, D. C., March 1, 1955.

DEAR SENATOR ANDERSON: During my appearance before the Joint Committee on Atomic Energy on Thursday, February 10, 1955, Senator Gore requested that I "inform the committee how the Dixon-Yates contract and the controversy which it has promoted has helped, is helping, or will assist in the development of peacetime uses of atomic energy or military application of atomic energy." I requested, and was given, permission to answer by letter rather than in an oral response. My reply has been necessarily delayed because of my absence from Washington from February 12 to February 20 in connection with the present series of weapons tests at the Nevada test site.

Briefly, I affirm that the Mississippi Valley Generating Co. contract per se is advantageous from the standpoint of our national interests. It will augment the reservoir of electric power for a vitally important defense and industrial area now dependent on TVA. The former Chairman of TVA, Mr. Gordon Clapp, advised the Director of the Bureau of the Budget in a letter dated December 24, 1953, that: "Provision of the 500,000 or 600,000 kilowatts presently planned to be secured by release of AEC load is of course essential to prevent a catastrophe in power supply in 1957."

On March 23, 1954, Mr. Clapp wrote to the Director of the Bureau of the Budget as follows:

"Since I last wrote you, we have received a request for 70,000 kilowatts of power to operate new supersonic research equipment which is to be installed by the Air Force at the Arnold Engineering Development Center near Tullahoma, Tenn. The additional power is expected to be required in 1957. In addition, the Air Force is asking that we review with them the problems that would be involved in the possible future supply of still greater amounts of power in increments of 50,000 kilowatts each. The operation of the new equipment at the AEDC probably can be limited to night hours, so that the effect upon our system power requirements will not be as great as for an on-peak load of equal size.

"However, this new AEDC requirement, together with the prospects of its further expansion like the new addition at Oak Ridge and the possibilities of AEC's operating at above normal level of power consumption there and at Paducah, illustrate the point that new Federal power demands will continue to occur from time to time in this area of special national defense advantages."

The Atomic Energy Commission has been concerned about this impending power shortage because two of our largest production plants are located at Oak Ridge and Paducah, in the area served by TVA. The continuity of full production of these plants must not be jeopardized by demands for power from other TVA customers in excess of prudent limits—a danger that would certainly arise if additional power were not available by 1957–58. In such circumstances it would be unfortunate if the Commission would have to assert priority over other consumers. The MVGC contract will provide for additional needed power, and at fair rates and without burdening the taxpayers of the United States through an increase in the national debt. In this connection, I invite your attention to the first seven paragraphs of a letter, dated November 10, 1954, from President Eisenhower to Hon. W. Sterling Cole, quoted below:

"On several occasions you and I have discussed the administration plan to relieve TVA of part of its obligation to furnish electric power to AEC in order that TVA, without additional steam plants built at taxpayers' expense, may have an adequate supply of electric power for its customers through 1957.

"My general thinking on the subject is this: It seems to me that all arguments for the construction by the Federal Government of the additional steam plants ignore this one and very important truth: If the Federal Government assumes responsibility in perpetuity for providing the TVA area with all the power it can accept, generated by any means whatever, it has a similar responsibility with respect to every other area and region and corner of the United States of America.

"Logically, every section of the United States should have the same opportunities, and the Federal Government should not discriminate between the several regions in helping to provide this type of facility. My own conviction is that we have not been alert enough in making certain of this equality of treatment.

If this is the case then it is high time that other regions were getting the same opportunities.

"I cannot believe that Americans, in general, disapprove of attempting to place all regions on a basis of equality in this regard. Consequently, there must either be some reexamination of any plans which would call for the Federal Government to supply all the additional power capacity that might be needed in the future in the Tennessee Valley, or logically we would have to begin plans for a gigantic power development to cover the entire Nation equitably.

"The directive to the AEC to make arrangements for the purchase of private power—either directly or by finding a new private source to replace available TVA power—was designed to allow time for a thorough examination of this whole vast field, without hurting the citizens of the valley.

"As a consequence of these facts, I believe that the project for building new plants at Federal expense—implying a purpose of continuing this process indefinitely in the future—is therefore wholly indefensible unless it should become part of a vast national plan. If this is to be national policy, it is most certainly a project that demands earnest and prayerful study. In the meantime, the citizens of that region will not be deprived of the additional power they need for the next several years.

"It seems to me that there has been a very great deal of talk and argument, much of it partisan, about issues that are really clear and simple. No one in this administration has any intention of destroying or damaging TVA or of diminishing its effectiveness in any way. But this is not the same thing as fastening on the Federal Government a continuing and never-ending responsibility which I frankly do not believe is logical nor, in the long run, in the best interests of the country."

In my opinion, the availability in the TVA area of adequate power, assured by the MVGC contract, will definitely facilitate the Commission's programs for the development of atomic power for peacetime uses and the production of fissionable materials for the stockpiling of atomic weapons for national defense. Thus, the MVGC contract will benefit our country as a whole and, incidentally, the Atomic Energy Commission. I am confident that you share my thesis that the welfare of the AEC is not separable or distinct from the welfare of the country.

Sincerely,

LEWIS L. STRAUSS, *Chairman.*

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

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(Additional information furnished by the Atomic Energy Commission.)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington 25, D. C., February 4, 1955.

Hon. CLINTON P. ANDERSON,
Cairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: In various portions of our testimony before the Joint Committee during the week of January 31, 1955, several members of the committee inquired as to the extent to which the Commission had received applications for licenses or indications of an interest in a license. I would like to amplify our testimony in this respect by the following:

Attached is a list of persons or firms who have expressed or given some indication of interest in writing of obtaining a license or licenses under the Atomic Energy Act of 1954.

Recognizing that the formulation and adoption of all the necessary licensing regulations and procedures under the new act would take considerable time, we have made an effort to work out interim arrangements with firms and institutions that are now ready to engage in activities which are subject to licensing but not yet covered by formal regulations. The following are examples of this practice:

The University of Michigan has under construction a research reactor. The design of the proposed reactor has been reviewed and approved by the Reactor

Safeguard Committee. In January 1955, the university applied for an operator's license and for such other licenses as might be necessary regarding the proposed research reactor. Necessary interim license arrangements are being made.

The University of California at Los Angeles has plans to build a reactor for medical research and therapy. The preliminary design of this reactor has been tentatively approved by the Reactor Safeguard Committee. A request for license has been received.

Armour Research Foundation has also applied for a license for a research reactor. The design of the proposed reactor is being reviewed by the Reactor Safeguard Committee.

A research reactor at North Carolina State College is in operation. The contract with North Carolina State, which was entered into before the act was passed, is considered as an interim license pending the issuance of our formal regulations.

A research reactor for Pennsylvania State University is now under construction after its design was reviewed and approved by the Reactor Safeguard Committee. An interim license is being drafted.

I think it is fair to say that the question of a license has not delayed any of these projects. A similar interim procedure has also been followed in the case of special nuclear material licenses. In the case of requests, as to which the Atomic Energy Act of 1954 requires the issuance of a license, the Commission has entered into the customary form of agreement with the distributee but has included in such agreement licensing provisions substantially as follows:

"The Atomic Energy Act of 1954 requires a license as evidence of your authority to possess, receive and use the above-described special nuclear material and this agreement shall be deemed to be such license. The license herein granted shall be limited to the quantity and type of special nuclear material designated above for the period of time and use described above; shall be deemed to contain the conditions specified in sections 53e and 183 of the Atomic Energy Act of 1954; and shall be subject to all applicable provisions of the Atomic Energy Act of 1954, and all applicable rules, regulations, orders and other instructions of the Atomic Energy Commission now or hereafter in effect."

Attached is a list of instances in which such arrangements have been made.

I think it appropriate to comment somewhat more fully on the letter of August 24, 1954, from the General Electric Co. In this letter, Mr. Francis K. McCune, general manager of the atomic products division, General Electric Co., informed the Commission of the company's desire to be licensed to the extent required for it to manufacture and sell atomic energy equipment. Mr. McCune asked for such information as we could supply at that time concerning the scope and nature of the data that would be required in applications for licenses under the 1954 act, and offered to meet with us if a personal discussion seemed advantageous.

The letter was written 6 days before the President approved the 1954 act. It was obviously too early for us to outline the scope and nature of the information that the Commission would require under the new law and we so advised Mr. McCune in a letter signed late September 3 and dated September 7. (Labor Day weekend intervened.)

We assumed that if in fact the company's contemplated program began to suffer on account of the need for AEC licenses, company representatives would get in touch with us, as other companies and institutions have done, to see whether licensing arrangements could be worked out on an interim basis. Although General Electric representatives have talked with us on numerous occasions since last fall, they have not prior to today, so far as I am aware, and so far as a check in our Washington office has revealed, informed us that the lack of AEC licenses was interfering with the company's operations, or inquired about the possibility of working out interim arrangements. This date Mr. McCune informed me that he felt that he needed to know more about our formal regulations and have a certainty that General Electric would receive a license to insure maximum progress in organizing for and proceeding with the program contemplated.

As I assured the committee, we are working on a top priority basis in preparing and issuing the necessary regulations in the licensing area.

Sincerely yours,

K. D. NICHOLS, *General Manager.*

Company	Date of letter	Nature of letter
General Electric Co	Aug. 24, 1954	To obtain whatever licenses necessary to carry out activities listed in letter.
Pennsylvania Transformer Co., Canonsburg, Pa.	Aug. 26, 1954	Requested information regarding procedures to be followed in applying for a license.
Battelle Memorial Institute, Columbus, Ohio	Jan. 25, 1955	Described meeting on Jan. 5, 1955, between BMI and COO to discuss BMI licensing applications.
World Steel Corp., Chicago, Ill	Aug. 31, 1954	Request to discuss construction of a reactor.
Perfection Tool & Metal Heat Treating Co., Chicago, Ill.	Sept. 2, 1954	Query re procedure for application to build reactor.
Tooele County Chamber of Commerce, Tooele, Utah.	Aug. 23, 1954	Query re requirements for establishment of a reactor.
Inferno Co., Shreveport, La	Sept. 10, 1954	Query re procedure required to obtain uranium for purpose of perfecting a home-heating boiler.
Crumpler Brick & Tile Co., Inc., Roseboro, S. C.	Jan. 11, 1955	Query re qualifications for owning and operating atomic powerplants.
The Gamma Corp., Mansfield, Mass	Dec. 30, 1954 Jan. 24, 1955	Indication of interest in construction of a radiation facility.
Adams Engineering Co., Inc., Miami, Fla	Jan. 17, 1955	Query regarding what aid can be obtained from the Government in the development and construction of power reactor.
Myron Uretsky (age 16), Brooklyn, N. Y	Jan. 25, 1955	Apply for license to use nuclear material to do research with an experimental boiling reactor.
E. L. Armstrong, Richland, Wash	Jan. 21, 1955	Legality of forming a consulting group in nuclear reactor development and any licenses required.
Phoenix Products Co	Jan. 24, 1955	How a concern may be licensed to use atomic energy or its byproducts.
University of Michigan University of California at Los Angeles Armour Research Foundation North Carolina State College Penn State University	----------	Status discussed in text of letter.

Special nuclear material licenses authorized or issued

Material and quantity	Licensee	Requested	Purpose	Approved
Irradiated uranyl nitrate (1 gram).	Chicago University	Jan. 19, 1955	Irradiated material will be used in a study of fission products.	Jan. 31, 1955
U-235 (5 grams) U-233 (1 gram) Pu-239 (1 gram) Pu-239 (3 grams)	Naval Radiological Defense Laboratory.	Dec. 22, 1954	To permit the laboratory to perform studies on fission products.	Do.
Pu-239 (0.1 microcurie)	Columbia University.	Oct. 21, 1954	Collimation studies in the development of special proportional counters to acquire a plated calibrating source of Pu-239.	Nov. 8, 1954
U-235 (100 milligrams)	Carnegie Institute of Washington.	Sept. 14, 1954	For use in Temmer's studies of the Coulomb excitation of energy levels.	Nov. 3, 1954
Depleted fuel elements from MTR.	Department of the Army.	Feb. 19, 1954	Use in food sterilization studies at Dugway, Utah.	[1] May 11, 1954 [2] Oct. 18, 1954

[1] Interim.
[2] Final.

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(Referred to on p. 160, pt. 1.)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C., February 12, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR SENATOR ANDERSON: During the course of the hearings on February 3, 1955, Senator Gore suggested that the members of the Commission furnish the Joint Committee with a policy statement concerning the basis for the Power Demonstration Reactor Program. We are happy to supply such a statement.

When the Power Demonstration Reactor Program was established, it was the Commission's best judgment that the art has not developed to a point where any industrial concern was likely to undertake the development, construction, and operation of a large-scale power reactor solely at its own risk and expense. It was felt that maximum incentive for industry to get on with the work, at minimum cost to the Government, could be provided through the license route, with its concomitant of private ownership, rather than through the alternative of industry contributions to Government-owned reactors, such as the PWR project. In the interest of encouraging industry to undertake the task on this basis, the Commission believed it necessary to be prepared to assist industry to the extent indicated in the Power Demonstration Reactor Program, and to inform industry of that fact. At the same time we set up the program with sufficient flexibility so that if our appraisal of the situation were not sufficiently optimistic and industry was in fact willing to attempt the achievement of practical nuclear power without Government help (as it appears now from press reports and testimony before your committee that Consolidated Edison of New York may be ready to do), we could proceed on such a basis. On the other hand, if our basic appraisal is generally correct, we will have avoided loss of time in moving forward with an expanded reactor program. Further, we believe that industry has considerable inducement not to seek AEC financial support through section 31a contracts, since technical information developed under those contracts would have to be shared with AEC and the entire technical public.

In addition, it should be noted that a Power Demonstration Reactor Program which offered no possibility of Government assistance would be susceptible to justifiable criticism on the ground that it would unduly favor the larger and richer companies to the disadvantage of others.

The Commission concluded, on the basis of its understanding of the authority given it by the Atomic Energy Act of 1954, that the kinds of AEC cooperation and assistance outlined in the power demonstration reactor program could properly be furnished, within the limits of available funds and materials, for the purpose of advancing the time when nuclear power would become economically competitive.

I am authorized to say that Dr. Libby and Mr. Murray have read this letter and approve its content.

Sincerely yours,

LEWIS L. STRAUSS, *Chairman.*

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Hon. LEWIS L. STRAUSS,
Chairman, United States Atomic Energy Commission,
Washington 25, D. C.

DEAR MR. STRAUSS: The February testimony went to press last week so it is too late to make the changes you included in your letter of February 23.

However, I will attach a copy of your letter to the copy of the transcript which is the official committee record of that hearing.

Sincerely,

CORBIN ALLARDICE, *Executive Director.*

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington 25, D. C., February 23, 1955.

Mr. CORBIN ALLARDICE,
Executive Director, Joint Committee on Atomic Energy

DEAR CORBIN: The following corrections should be made in the transcript of the hearing of February 10 before publication if it is not too late to do so.

Page 744, line 4 (hearings, pt. 2, p. 360, line 23): The word "you" should read "me".

Page 746, line 22 (hearings, pt. 2, p. 361, line 36): The word "issued" should read "used".

Page 754, line 8 (hearings, pt. 2, p. 364, line 18): The word "of" should be stricken.

Page 764, line 14 (hearings, pt. 2, p. 368, lines 35 and 36): Should read: in that connection "I wish to offer".

Sincerely yours,

LEWIS L. STRAUSS.

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(Correction of statement by Walker-Cisler, p. 254 of pt. 2.)

THE DETROIT EDISON CO.
Detroit, Mich., February 10, 1955.

Mr. WALTER A. HAMILTON,
Staff Member for Reactor Development, Joint Committee on Atomic Energy, United States Senate, Washington 25, D. C.

DEAR MR. HAMILTON: During the hearings before the Joint Committee on Atomic Energy on February 7, Congressman Holifield asked me how many employees the Atomic Power Development Associates had secured from the Atomic Energy Commission. My reply was that we had obtained two employees from this source. Since returning to Detroit, we have reviewed this matter and wish to offer the following amplification of the reply.

As I stated, we have had two men from the AEC; Glen Wensch from Los Alamos and Russell Stanford from the Fernald Works. Dr. Wensch is a Vitro employee on loan to our project; however, he is leaving us on March 10 to rejoin the staff of the AEC. In addition, we have 4 men working on the project from Commission contractors' facilities—3 from ANL and 1 from KAPL. One of the men from ANL is a Babcock & Wilcox employee on loan to the project as a part of the B. and W. participation in our effort. Where we have hired ANL or KAPL men, it has been done with the full knowledge and prior agreement of the laboratory in each case.

If you consider it desirable, I should be glad to have the foregoing added to the record to supplement my testimony. I appreciate indeed the courtesies extended to me by the members of the Joint Committee and its staff.

Sincerely,

WALKER CISLER.

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(Supplemental statement of Clyde T. Ellis)

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION,
Washington 6, D. C., February 4, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
Senate Office Building, Washington, D. C.

DEAR SENATOR: Attached is a copy of the letter we are sending Chairman Strauss of the Atomic Energy Commission outlining our serious complaints concerning matters that are transpiring within the AEC and concerning the treatment which the rural electrification program is receiving.

We will appreciate whatever assistance you can give the program. We think it would be very helpful if Chairman Strauss were asked about these matters.

Sincerely,

CLYDE T. ELLIS,
Executive Manager.

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION,
Washington 6, D. C., February 3, 1955.

Adm. LEWIS L. STRAUSS,
Chairman, United States Atomic Energy Commission,
Washington 25, D. C.

DEAR ADMIRAL STRAUSS: The rural electric systems have a large stake in the Atomic Energy Commission's atomic power program. They hope the promise of atomic power will assist them with some of their difficult power problems, among which are high wholesale power costs, the need for small generating units, low load factors, costly transmission lines and ever-increasing loads. They insist that the benefits of atomic power be made available to them and they not be excluded from the program because they are small and poor. They feel that the policies established and being established at the AEC will result in their being excluded, and that such policies will encourage monopoly and lessen competitive influences in the electric power industry. We are greatly disturbed about certain developments at the AEC as they will affect the rural electrification program in the United States. Among these developments are the following:

(1) The AEC was authorized by the Atomic Energy Act of 1954 to establish a division dealing with the development and application of civilian atomic power. This division could provide the small rural electric systems with competent technical advice which they do not have available and are unable to afford. The AEC has not established any such division, and it has been our experience that the present reactor development division staff has such a heavy workload that they are able to give us very little assistance and advice on the development of atomic power for rural areas. If additional funds are needed to establish a division of civilian power with adequate staff and adequate research and development funds, we feel the Congress will provide this.

(2) The AEC is obviously in the process of making far-reaching administrative decisions on patents, licensing procedures, clearance regulations, pricing of nuclear materials, etc., which may determine the course of the atomic power industry for many generations. The AEC has not asked for the advice of the small cooperative and public electric systems before promulgating these decisions. They surely are consulting the large private utilities. These small consumer-owned systems provide the real competitive influence in the electric industry and if they are excluded from being heard before the AEC makes important administrative rulings and regulations which may affect the very existence of these systems, the hand of monopoly in the atomic power program will be strengthened. The AEC could hold public hearings with ample time for the rural electric systems to be heard, or could establish a civilian power advisory committee with adequate representation for the cooperative and public power systems to present their views on such important decisions. But the AEC has never asked the advice of the rural electric cooperatives before promulgating an administrative decision.

(3) Most of the AEC power reactor program is being devoted to projects which will benefit the large private utilities. There is no work being carried out which will satisfy the needs of the rural electric systems. The Army package reactor program certainly is not such a program because it is a very specialized application of atomic power in which factors other than cost are of primary importance. For several years now the rural electric systems have indicated that they want to participate in the construction and operation of a nuclear powerplant under one of the AEC's reactor research and development programs. The rural electric systems offer ideal sites for the construction of atomic powerplants because of their high wholesale power costs in many areas, their low cost of financing and their nonprofit operations. We feel the AEC could develop a feasible plant in these areas and also be able to accurately measure what the actual costs are. The rural electric systems have been told that if they can submit a proposal comparable to Duquesne Light, the AEC may consider it, but they have not been offered any technical advice or assistance or encouragement in working up any sort of proposal. The rural electric systems are being excluded from this program because they cannot compete with these

giant utilities, nor can they submit proposals without considerable technical assistance from both REA and AEC.

(4) Recently we heard of two instances, in Illinois and New York, where AEC installations are offering surplus power to preference customers under section 44 of the Atomic Energy Act. But the AEC is doing absolutely nothing to effectively implement these preference provisions. If anything, your people are, in effect, trying to discourage the rural electric systems from trying to obtain this power by requiring them to submit bids for the purchase of the power in competition with the private utilities, and by not giving them sufficient time to prepare engineering studies and negotiate for the purchase of this power which they are entitled to under the law. For instance, in one case they asked the rural electric cooperatives to indicate within 2 weeks if they were interested in acquiring this power, which will be available over 6 months later. The AEC officials involved indicated they had already consulted several of the large private utilities in the area and they had indicated their interest in obtaining the power. These AEC officials seem to consider the preference provisions as nuisance provisions which can be disposed of by obtaining over the phone from a preference customer, a refusal to purchase the power after the preference customer has been given a very dismal picture of the nature of this power. The rural electric systems have not even been told what the price of this power is, but they have been asked by the AEC officials to submit a bid on it. This really amounts to preference to the highest bidder, not to those who are entitled to preference under the law. It is ridiculous.

With proper cooperation from the AEC the rural electrics might be able to negotiate with the nearby power companies for power to firm up this AEC power, or for some sort of contract whereby the rural electrics will benefit from this power. But if the power companies know they are going to get the AEC power anyway, they will not be in the least interested in negotiating with the farmers' electric systems.

(5) It seems to be very difficult to obtain clearance for access to atomic power information. Last October NRECA applied for clearance for the members of its atomic energy committee and some of its staff, but as yet none of these people have been cleared. Clearance must be readily obtainable to enable the officials of our rural electric systems to participate in programs such as the demonstration power reactor program, which has a deadline of less than 3 months for submission of proposals. Otherwise these programs are restricted to the big corporations who already have obtained the necessary clearance for some of their personnel.

Also we believe every attempt should be made to declassify as much civilian power information as possible, and every effort made to get it into the hands of the public and cooperative systems. These systems, on the whole, do not have the resources to establish highly technical study groups, and therefore they are dependent on the AEC to make as much information available to them as possible. The AEC seems to be making very little effort along these lines.

(6) Recently the AEC announced it was establishing a schedule of charges it will make for materials used in private atomic energy development, and prices it will pay for products from private reactors. These prices, of course, are absolutely essential to anyone desiring to submit proposals to the AEC for the construction of an atomic power reactor, but in the same announcement the AEC states this material will be made available only to properly cleared persons. We do not quite understand how prices which affect the basic structure of what may be one of our most important civilian industries, can be classified, and not made available to all so as to encourage the widest possible participation in this new technology. This, of course, precludes any electric utility from submitting a proposal to build an atomic powerplant unless the people working on that proposal and having to make the basic decisions on that proposal are cleared by the AEC. It certainly limits those who are able to participate in a program financed primarily by their Government, and which should benefit all the people, not just a few great corporations.

(7) It has been impossible for us to obtain any information about the AEC budget except that which is contained in the budget document. We can't understand why those who are interested in a civilian power program cannot obtain a breakdown of amounts allocated for civilian reactor research and development and such programs as the demonstration power reactor program, the industrial participation program and the construction of specific reactors such as the pressurized water reactor, the boiling water reactor, the sodium graphite reactor, etc. It is only through being able to obtain such information that we

can intelligently gage the progress being made in civilian power development, and constructively criticize this program if necessary.

(8) Recently the AEC announced a demonstration power reactor program. We fear that this program as set up will only serve to further encourage the trend toward monopoly which is already so evident in the administration of the AEC. Your announcement establishes an April 1 deadline for the submission of proposals to construct power reactors. This deadline precludes the participation of any group except those already in the industrial participation program. This includes some of the largest industrial and power companies in the country and only two public groups, TVA and Consumers Public Power District of Nebraska. Anyone who does not have clearance and does not have the technical knowledge acquired by these study groups, would find it next to impossible to submit a proposal under this program. Also the AEC stated in its announcement that one of the criteria which will govern the acceptance of a proposal under this program is the cost to the AEC in funds and material. This throws the small rural electric cooperatives into competition with the largest private utilities in the country. We do not have million of dollars to invest in atomic powerplant development, nor do we have access to rapid tax writeoffs as Duquesne obtained on the Shippingport plant. We are engaged in nonprofit operations in areas which are often quite marginal economically, and which in many cases the private utilities did not care to serve. How can we assess our member consumers for large development costs? At the same time, the low-cost financing, the nonprofit operations and the power needs of the rural electric systems make it absolutely essential that they be considered in any demonstration power reactor program, and only through their participation will the Government be able to determine what the costs of such atomic powerplants really are.

(9) NRECA is seriously considering executing a study agreement with the AEC. We made it clear to the AEC in several conferences that NRECA and its member systems do not have technical and financial resources of the billion-dollar corporations which are usually included in these study groups. But at no time has the AEC indicated that they are fully cognizant of this and will make more than the usual effort to assist our study group in order to make the benefits of atomic power available to the rural people. Will the rural people have to wait as long for atomic power as they did for electricity?

We trust you will give these matters of such concern to us your urgent consideration.

Sincerely,

CLYDE T. ELLIS, *Executive Manager.*

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION,
Washington, D. C., March 4, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Congressional Committee on Atomic Energy,
Senate Office Building, Washington, D. C.

DEAR SENATOR: We have received a copy of a letter dated March 1, sent to you by Mr. Purcell L. Smith, president of the National Association of Electric Companies. We certainly do not believe it is proper to engage in an extended debate with Mr. Smith through the auspices of your committee, but we believe we cannot let Mr. Smith's letter of March 1 go unanswered.

We believe Mr. Smith's letter confirms, to an even greater extent than we were ever aware of, the close working relationships between the public information program, conducted by Bozell & Jacobs and the National Association of Electric Companies. Mr. Smith in his letter states that "occasionally, to avoid duplication, there is a joint communication sent out to members of both organizations signed by a head of both organizations." This certainly, in our mind, indicates a rather close association. Also, Mr. Smith goes on to state in his letter: "The views of the National Association of Electric Companies and the electric companies public information program very naturally, because of the many common member companies, coincide in practically every particular." We do not believe that any further proof is needed of the close working relationships existing between Bozell & Jacobs and the National Association of Electric Companies. For this reason we again wish to state we believe it is improper for the AEC to retain, as a consultant, a man in the employ of Bozell & Jacobs, and also to permit this man to retain his "Q" clearance from the AEC.

The National Association of Electric Companies does not have to be concerned about proper representation on the advisory committees of the AEC. On

the advisory committee appointed on February 10, 1955, to advise the AEC on proposed licensing regulations and policies, there are 14 private power companies or holding companies and only 1 nonoperating rural electric cooperative. Many of these power companies are members of the National Association of Electric Companies. NRECA does not have, and has not been able to obtain, any such representation on these AEC advisory committees.

Mr. Smith states in his letter that his association does not plan to use the Joint Congressional Committee on Atomic Energy "for a comprehensive general discussion of the many factors having to do with the activities of several departments and agencies of the Federal Government in connection with operation of electric power generating and other facilities which have relationship to several Federal laws other than the Atomic Energy Act." Mr. Smith seems to imply by this statement that our appearance before the Joint Committee was improper. We appeared before this committee at the invitation of the chairman of this committee. We believe and we insist upon our right to appear before this committee and present any of our problems which are related to the atomic-power program. We wish Mr. Smith would avail himself of this opportunity to express his views on the atomic-power program and answer any questions the members of the committee may wish to raise.

If the letter of Mr. Purcell Smith is inserted in the record following our statement as he requested, we also request that the committee insert our letter in the record following the letter of Mr. Smith.

Sincerely,

CLYDE T. ELLIS, *General Manager.*

APPENDIX C

To: Joint Committee on Atomic Energy.
From: Conference of State Sanitary Engineers.
Re: Statement Concerning Certain Recommended Amendments to the Atomic Energy Act of 1954.

My name is Earl Devendorf. I am director of the Bureau of Environmental Sanitation (chief engineer) of the New York State Department of Health.

I am appearing on behalf of and am past chairman of the Conference of State Sanitary Engineers. The Conference of State Sanitary Engineers has been established for something over a quarter of a century and is composed of the chief engineers of the health departments of the various States and their staffs.

The Conference of State Sanitary Engineers has, over a quarter of a century, developed a very closely integrated relationship with the United States Public Health Service to whom we have come to look for technical assistance and and leadership in all matters relating to water supply, sewerage, and industrial wastes disposal and other environmental sanitation and public health engineering matters that are the legal responsibility in each of our various State health department jurisdictions.

The chief engineers of the State departments of health have direct responsibility regarding the safety and protection of public water supplies. It is in line with these direct responsibilities in our various States that the Conference of State Sanitary Engineers feels that in accordance with their long-established responsibilities, they are particularly concerned with the use of radioisotopes and the development of nuclear reactors by private industries through license by the Atomic Energy Commission and have participated in a number of joint meetings on this subject in the past with the representatives of the United States Public Health Service and the Atomic Energy Commission.

The present act does not provide for State and United States Public Health Service participation in their respective jurisdictions for the protection of health and for supervision and control of the disposal of radioactive wastes, nor is the Atomic Energy Commission clearly authorized to encourage and assist State health departments and other responsible agencies by training and other means to develop their knowledge and competency, and to assume responsibility for health and safety aspects of nuclear energy operations. We accordingly approve and endorse the resolution being presented by Mr. Harry Jordan, secretary of the American Water Works Association.

I wish to also speak of the responsibilities of the States with regard to the control of other hazards associated with the use of ionizing radiation. In my State, my commissioner, Dr. Herman E. Hilleboe, recognized the need for our department to prepare to control the environmental health problems associated with the steadily increasing use of ionizing radiation sources, such as X-ray producing equipment, radioisotopes and other radioactive material and the projected increase in the number of nuclear reactors. Accordingly, during the latter part of 1953 and the early part of 1954, our department made a study of the various hazards and prepared a plan for a program to control them. This program plan included 11 functions which the department would carry out to reduce the hazards from ionizing radiation, such as to locate and inspect all sources of ionizing radiation; to furnish consultation to users of radiation; to train personnel of local health departments; to conduct demonstrations; to provide public health educational materials and promote adequate health safety facilities and to sponsor legislation and regulations.

Commissioner Hilleboe appointed a committee of experts in the field of radiological health, under the chairmanship of Dr. Howland, of Rochester University, to advise the department on such matters as (1) the health problems resulting from the use of radiation in New York State, and (2) what role the New York State Health Department should play in a control program. This committee recommended that a significant radiological health problem existed in New York State which could be expected to increase in severity in the future; that there was an urgent need for the health department to institute a radiological health program; that many radiation hazards exist over which there are no controls at the present; that the State health department was the logical agency to carry on a radiological health program and should be encouraged to enact regulations for the control of radiation hazards.

Accordingly, in November of 1954, a draft of chapter XVI of the New York State Sanitary Code entitled, "Ionizing Radiation" was submitted to the New York State Public Health Council. The council reviewed and adopted this new chapter of the New York State Sanitary Code and established its effective date as July 1, 1955.

Generally, the regulations in this chapter of the code are designed to control all hazards resulting from the use of ionizing radiation. The only exceptions are those hazards to employee health in industrial and commercial establishments which are a responsibility of the New York State Department of Labor. That department is currently considering the adoption of regulations for the protection of employees in industrial and commercial establishments. Regulation 9 of chapter XVI, relating to the disposal of radioactive wastes, will control radioactive wastes discharged to the environment, regardless of their source.

STATE OF NEW YORK DEPARTMENT OF HEALTH,
BUREAU OF ENVIRONMENTAL SANITATION,
Albany 1, February 4, 1955.

Mr. HARRY E. JORDAN,
Secretary, American Water Works Association, Inc., New York 17, N. Y.

DEAR MR. JORDAN: In accordance with the request contained in your letter of January 28, I am forwarding to you a copy of chapter XVI of the New York State Sanitary Code which will become effective July 1, 1955.

Very truly yours,

ALEXANDER RIHM, Jr., P. E.,
Chief, Radiological Health and Air Sanitation Unit.

NEW YORK STATE SANITARY CODE

CHAPTER XVI. IONIZING RADIATION

REGULATION 1. DEFINITIONS. (a) The term "radiation" or "ionizing radiation," as used in this chapter, shall mean the propagation of energy through space or through a material medium in the form of rays or particles; specifically, it refers to alpha and beta particles, electrons, protons, neutrons, gamma rays, x-rays and other electromagnetic or particulate radiations which are capable of producing ions directly or indirectly in their passage through matter, but the term does not refer to visible, infrared and ultraviolet radiations.

(b) The term "roentgen" (r) shall mean the quantity of x- or gamma radiation such that the associated corpuscular emission per 0.001293 grams of air produces, in air, ions carrying one electrostatic unit of quantity of electricity of either sign. Milliroentgen (mr) equals 1/1000 of a roentgen.

(c) The term "rad" as used in this chapter is a measure of the energy imparted to matter by ionizing particles per unit mass of irradiated material at the place of interest and is equal to 100 ergs/gram. Millirad (mrad) is equal to 1/1000 rad.

(d) The term "rem" as used in this chapter is that quantity of any type of ionizing radiation such that the energy imparted to a biological system (cell, tissue, organ, or organism) per gram of living matter by the ionizing particles present in the region of interest has the same biological effectiveness as an absorbed dose of 1 rad of x-radiation with average specific ionization of 100 ion pairs per micron of water in terms of its air equivalent in the same region. Millirem (mrem) is equal to 1/1000 rem.

(e) The term "Relative Biological Effectiveness (RBE)" is the appropriate biological effectiveness of one type and energy of radiation relative to that of x-rays with a specific ionization of 100 ion pairs per micron of water (lightly filtered X-rays of quantum energy less than 3 million electron volts (mev)) for the particular biological system and biological effect and for the conditions under which the radiation is received. A dose in rems is equal to the dose in rads multiplied by the appropriate RBE.

(f) The term "curie" as used in this chapter shall mean that quantity of any radioactive nuclide in which the number of disintegrations per second is 3.7×10^{10}. Millicurie (mc) equals 1/1000 of a curie. Microcurie millicurie.

(g) The term "radiation installation" as used in this chapter shall mean any installation (permanent or temporary) where radiation equipment is used or where radioactive materials are transported, stored, or used for any purpose, including the immediate vicinity of such radiation-producing equipment or material, in a hospital; institution; medical clinic; medical office; dental clinic; dental office; veterinarian clinic; veterinarian office; podiatry office; educational institution: commercial, private, or research laboratory performing diagnostic tests or handling equipment or materials for medical use; shoe store; any trucking, storage, messenger, or delivery-service establishment; or in any industrial or commercial or any other establishment not supervised by the New York State Department of Labor in accordance with the Laws of New York State. Radiation installation shall not include vessels, aircraft, railroad cars, or motor vehicles subject to the regulations adopted by the Interstate Commerce Commission, United States Coast Guard, United States Post Office, or Civil Aeronautics Board.

(h) The term "radiation equipment" as used in this chapter, unless otherwise specified, shall include any device which emits or may emit significant quantities of electromagnetic or particulate radiation. Radiation equipment shall not include equipment operated at less than 15 Kilovolts which is not intended to produce radiation, or equipment operating normally at higher voltages, but which, by nature of design, does not produce radiation at the point of nearest approach at a weekly rate higher than one-tenth the appropriate basic maximum permissible total weekly dose for any critical organ exposed. It shall not include equipment not being used or operated in such a manner that it can produce radiation.

(i) The term "radioctive material," as used in this chapter, is any solid, liquid, or gaseous substance containing radioactive nuclides or atoms which undergo spontaneous disintegration resulting in the emission of significant quantities of one or more types of radiation such as alpha particles, beta particles, and gamma photons, which are capable of producing ions directly or indirectly in their passage through matter. As used in this chapter, radioctive material shall not include:

(1) Natural radioactice materials having an equivalent elemental specific radioactivity not exceeding that of natural potassium.

(2) Small lots of time pieces, instruments, novelties or devices containing self-luminous elements, except during manufacture or repair of the self-luminous elements themselves. Such time pieces, instruments, novelties or devices shall be included, however, if they are stored, used, or handled in such quantity or fashion that any person might receive a radiation dose exceeding one-tenth the maximum permissible total weekly dose.

(3) Radioactive material of such quantity that if the total amount were taken internally, continuously or at one time by a person, no serious harm would be

likely to result. The upper limits of the quantities of such radioactive materials are as follows:

TABLE 1

Element:	*Upper Limit Microcurie*	Element—Continued	*Upper Limit Microcurie*
Pb^{210}	1	As^{76}	100
Po^{210}	1	Rb^{86}	100
At^{211}	1	Sr^{89}	100
Ra^{226}	1	Y^{91}	100
Ac^{227}	1	Nb^{95}	100
U^{233}	1	Tc^{96}	100
Thorium	1	Rh^{105}	100
Uranium	1	Cd^{109}	100
Pu^{239}	1	Ag^{111}	100
Am^{241}	1	Sn^{113}	100
Cm^{242}	1	Te^{127}	100
So^{46}	10	Ba^{140}	100
Co^{60}	10	La^{140}	100
Sr^{90}	10	Pr^{143}	100
Ru^{106}	10	Sm^{151}	100
Ag^{105}	10	Ho^{166}	100
Te^{129}	10	Tm^{170}	100
I^{131}	10	Lu^{177}	100
Cs^{137}	10	Ta^{182}	100
Ce^{144}	10	Pt^{191}	100
Eu^{154}	10	Pt^{193}	100
W^{181}	10	Au^{198}	100
Re^{183}	10	Au^{199}	100
Ir^{192}	10	Tl^{200}	100
P^{32}	100	Tl^{204}	100
C^{236}	100	Pb^{203}	100
Ca^{45}	100	Th^{234}	100
Sc^{47}	100	H^{3}	1,000
Sc^{48}	100	Be^{7}	1,000
V^{48}	100	C^{14}	1,000
Fe^{59}	100	Na^{24}	1,000
Zn^{65}	100	S^{35}	1,000
Ga^{72}	100	K^{42}	1,000
Cr^{51}	1,000	Pd^{103}	1,000
Fe^{55}	1,000	Pm^{147}	1,000
Mn^{56}	1,000	Ir^{190}	1,000
Ni^{59}	1,000	Au^{196}	1,000
Cu^{64}	1,000	Tl^{201}	1,000
Ge^{71}	1,000	Tl^{202}	1,000
Mo^{99}	1,000		

(j) The term "radioactive waste," as used in this chapter, shall include any solid, liquid, or gaseous substance which contains radioactive material, regardless of its source, which is discharged into the environment.

(k) The term "competent person," as used in this chapter, shall mean an individual who has received training or instruction in radiation hazards and their control, sufficient to specify protection for himself and others in the vicinity.

(l) The terms "hazard" or "hazardous amounts of radiation," when used in relation to external radiation exposure, shall refer to any exposure rate, which may result in a person receiving a total dose, exceeding the maximum permissible total weekly dose. When used in relation to internal exposure, they shall refer to concentrations of radioactive material in air, food, or water, which exceed the maximum permissible concentrations in air, food, or water for continuous exposure.

REGULATION 2. REGISTRATION. Every person, firm, or corporation owning or operating a radiation installation as defined in this chapter shall register such installation with the State Department of Health prior to July 1, 1955. All new installations as defined in this chapter made on or after July 1, 1955, shall be registered with the State Department of Health before the installation is

placed in operation. Such registration shall be made on a form prescribed by the State Commissioner of Health.

The use of registered mail shall serve to indicate compliance with this regulation.

Registration shall not imply approval of manufacture, storage, use, handling, or operation, but shall serve merely to notify the State Department of Health of the location and character of radiation sources.

Any change in the character of the radiation installation such as addition to number of sources, source strength, output, type of energy of radiation produced, shall be considered as a new installation and shall be registered with the State Department of Health. Blanket registration may be offered to those radiation installations where registration of each device or each installation individually would represent an undue hardship or be impractical.

REGULATION 3[1]. CONSTRUCTION, MAINTENANCE AND OPERATION. Every radiation installation shall be constructed, maintained, and operated in such a manner as not to endanger the health and safety of any person.

Whenever any shielding or any other protective device is found to be operating improperly, is defective, or insufficient to such a degree that it may constitute a hazard to any person, the operation of the installation shall be discontinued, and shall not be resumed until such shielding or device shall have been properly changed, augmented, or repaired.

REGULATION 4. MAXIMUM PERMISSIBLE EXPOSURE. (a) The exposure of a person or persons to ionizing radiation shall always be kept to the lowest practicable level.

(b) When the source of radiation is outside the body the maximum permissible weekly dose shall not exceed the following:

(1) Ionizing Radiation of any Type or Types. The maximum permissible total weekly doses for adults under 45 years of age, whose entire body, or major portion thereof, is exposed to ionizing radiation from external sources for an indefinite period of years shall be 300 mrems in the blood forming organs, the gonads, and the lenses of the eyes; 600 mrems in the skin; and the respective values of the weekly doses in millirems in all other organs and tissues of the body according to the basic permissible dose distribution. The corresponding maximum permissible total weekly doses for persons 45 years of age or older similarly exposed shall be double the above stated values, provided that the portion of the weekly dose in the lenses of the eyes contributed by radiation of high specific ionization does not exceed 300 mrems.

(2) X-rays (Roentgen Rays, Gamma Rays) with Photon Energy Less Than 3 Million Electron Volts (mev). The maximum permissible total weekly doses for adults under 45 years of age whose entire body, or major portion thereof, is exposed solely to x-rays with photon energies less than 3 mev from external sources for an indefinite period of years shall be 300 mr measured in air at the point of highest weekly doses in the region occupied by the person, provided that the actual total weekly doses in the gonads do not exceed 300 mrads. The corresponding maximum permissible total weekly doses for persons 45 years of age or older similarly exposed shall be double the above stated values, provided that the actual total weekly doses in the lenses of the eyes do not exceed 600 mrads.

(3) Radiation of Very Low Penetrating Power (Half-Value Layer (HVL) Less than 1 millimeter of Soft Tissue). The maximum permissible total weekly doses in the skin for adults of any age whose entire body, or major portion thereof, is exposed to ionizing radiation of very low penetrating power for an indefinite period of years shall be 1,500 mrems, provided that the total weekly doses in the lenses of the eyes do not exceed 300 mrems.

(4) Local Exposure of the Hands and Forearms to Any Ionizing Radiation. The maximum permissible total weekly doses for adults of any age whose hands and forearms are exposed to ionizing radiation from external sources for an indefinite period of years shall be 1,500 mrems in the skin, provided the respective weekly doses in millirems in all other tissues of the hands and forearms are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose at 1,500 mr in the skin.

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[1] As a general guide to compliance with Regulation 3, the recommendations of the National Committee on Radiation Protection, as published in Handbooks 23, 41, 42, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, and 59 of the National Bureau of Standards, and such other recommendations as may be made by that committee, may be followed.

The applicable regulations of the Interstate Commerce Commission, Civil Aeronautics Board, United States Coast Guard, and United States Post Office may be used as a general guide to compliance with this regulation in relation to the proper storage and intrastate shipment of radioactive materials.

(5) Local Exposure of the Hands and Forearms to X-rays (Roentgen Rays, Gamma Rays) of Any Photon Energy. The maximum permissible total weekly doses for adults of any age whose hands and forearms are exposed solely to x-rays from external sources for an indefinite period of years shall be 1,500 mr in the skin.

(6) Local Exposure of the Feet and Ankles to Any Ionizing Radiation. The maximum permissible total weekly doses for adults of any age whose feet and ankles are exposed to ionizing radiation from external sources for an indefinite period of years shall be 1,500 mrems in the skin, provided the respective weekly doses in millirems in all other tissues of the feet and ankles are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose of 1,500 mr in the skin.

(7) Local Exposure of the Feet and Ankles to X-rays (Roentgen Rays, Gamma Rays) of Any Photon Energy. The maximum permissible weekly doses for adults of any age whose feet and ankles are exposed solely to x-rays from external sources for an indefinite period of years shall be 1,500 mr in the skin.

(8) Local Exposure of the Head and Neck to Any Ionizing Radiation. The maximum permissible weekly doses for adults whose heads and necks are exposed to ionizing radiation from external sources for an indefinite period of years shall be 1,500 mrems in the skin and 300 mrems in the lenses of the eyes, provided the respective weekly doses in millirems in all other tissues of the head and neck are not in excess of those that would result from exposure to ordinary x-rays at a weekly dose of 1,500 mr in the skin. The weekly doses in the lenses of the eyes for persons 45 years of age or older may be 600 mrems, provided that the portion contributed by radiation of high specific ionization does not exceed 300 mrems.

(9) Local Exposure of the Head and Neck to X-rays (Roentgen Rays, Gamma Rays) of Any Photon Energy. The maximum permissible total weekly doses for adults whose heads and necks are exposed solely to X-rays from external sources for an indefinite period of years shall be 1,500 mr in the skin and 450 mr in the lenses of the eyes. The weekly doses in the lenses of the eyes for persons 45 years of age or older may be 600 mr.

(10) Accidental or Emergency Exposure to X-rays (Roentgen Rays, Gamma Rays) with Photon Energy Less than 3 mev. Accidental or emergency exposure of the whole body of adults or parts thereof to x-rays with photon energy less than 3 mev, from external sources, occurring only once in a lifetime of a person, under the conditions and in the respective doses stated below shall be assumed to have no effect on the radiation tolerance status of that person. (a) Exposure of the whole body—any adult. Total dose measured in air up to 25 r. (b) Local Exposure—any adult. Dose measured in air and additional to whole body dose; hands and forearms, up to 100 r; feet and ankles, up to 100 r.

(11) Planned Emergency Exposure. Emergency work involving high-level exposure to x-rays with photon energies less than 3 mev shall be carried out on the basis that the person will not receive doses higher than one-half the respective doses stipulated in paragraph (b) (10) of this regulation. Women of reproductive age and all persons under 18 years of age shall not be subjected to planned emergency exposure.

(12) Accidental or Emergency Exposure to Other Types of Ionizing Radiation. Paragraphs (b) (10) and (b) (11) of this regulation are applicable to accidental or emergency exposure to ionizing radiation of any type and energy when the tissue doses resulting therefrom in the different organs and tissues of the body (expressed in rems) do not exceed numerically the respective tissue doses in rads resulting from exposure to x-rays with photon energy less than 3 mev, under the conditions stipulated in paragraph (b) (10); provided, however, that the portions of the respective tissue doses in rems contributed by radiation of high specific ionization do not exceed 50 percent of the total tissue doses.

(13) Exposure to X-Ray for Medical Reasons. Exposure of any part of the body to x-rays resulting from ordinary medical diagnostic procedures shall be assumed to have no effect on the radiation tolerance status of the person concerned, provided that no contributory, accidental, or emergency exposure of the order of magnitude specified in paragraphs (b) (10), (b) (11), and (b) (12) of this regulation has occurred within the previous 3 months.

(14) Exposures Exceeding Basic Permissible Weekly Organ Doses. In exceptional cases in which it is necessary for a person to receive in one week more than the basic permissible weekly organ doses, the unit of time may be extended to 13 weeks (¼ year); provided that the dose in any organ accumulated during a period of any 7 consecutive days does not exceed the respective basic permissible weekly doses by more than a factor of three; and provided further, that the

total dose in any organ accumulated during a period of any 13 consecutive weeks does not exceed 10 times the respective basic permissible weekly dose. (See table 2.)

(15) Total Dose. The maximum permissible weekly total dose for an individual shall be considered as including all doses, from all types and energies of radiation, whether delivered simultaneously or successively, during the period of measurement, to the region of interest.

(c) When the source of radiation is radioactive materials within the body, the dose rates to the tissues of the body shall be controlled by limiting the average rates at which radioactive materials are taken into the body either by inhalation or by ingestion. The maximum permissible concentrations of radioactive material in air and water shall be in accordance with nationally recognized limits.[2]

(d) The radiation doses to persons under 18 years of age, pregnant women or any population group or any person or persons outside the installation shall be limited to one-tenth the maximum permissible amounts stated in Regulation 4 (b) and 4 (c).

(e) Nothing in this regulation shall be construed to limit the kind and amount of radiation that a physician or dentist may intentionally apply to a person in diagnostic or therapeutic treatment.

The limitations expressed in this regulation shall not apply to exposure received by persons being fitted for shoes in a shoe fitting fluoroscope provided such fluoroscope installation is constructed, operated and maintained in compliance with Regulation 19 of this chapter.

(f) The State Commissioner of Health or the full-time County or City Commissioner of Health having jurisdiction may in specific instances establish such other combinations of dose rate, time, concentration or other restrictions which, in his opinion, are necessary to eliminate conditions which are dangerous or potentially dangerous to health.

TABLE 2.—*Maximum permissible total weekly doses in critical organs under various conditions of external exposure*

Condition of exposure		Unit	Adult age	Critical organ (weekly doses in significant volume in region of highest dose rate (mr))				
Part of body	Radiation			Skin	Blood-forming organs	Gonads	Lens of the eye	Air dose [1]
Whole body	Any radiation	Mrem	Under 45	600	300	300	300	----
			Over 45	1,200	600	600	[2] 600	----
Do	X-rays only (up to 3 mev).	Mrad	Under 45	[3] 450	[3] 400	300	[3] 450	300
			Over 45	[3] 900	[3] 800	[3] 800	600	600
Do	Any radiation with HVL 1 mm. of soft tissue.	Mrem	Under 45	1,500	[4] 300	[4] 300	300	----
			Over 45	1,500	[4] 600	[4] 600	[4] [2] 600	----
Hands and forearms.	Any radiation	Mrem	Under 45	1,500	[5] 300	300	300	----
			Over 45	1,500	[5] 600	600	[2] 600	----
Feet and ankles	do	Mrem	Under 45	1,500	[5] 300	300	300	----
			Over 45	1,500	[5] 600	600	[2] 600	----
Head and neck	do	Mrem	Under 45	1,500	[5] 300	300	300	----
			Over 45	1,500	[5] 600	600	[2] 600	----

[1] "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by a person, without the presence of the human body or other absorbing and scattering material.
[2] Including not more than 300 mrems of radiation of high specific ionization.
[3] Rough estimates of maximum values resulting from specified air doses, under practical conditions of exposure.
[4] Limits for concurrent exposure to penetrating radiation.
[5] In main portion of body. Not in region of highest dosage rate (hand, foot, or head).

REGULATION 5. SUPERVISION. All radiation installations shall be under the supervision of a competent person who shall be responsible for the observance of all necessary safety precautions.

The person in responsible charge of a radiation installation shall be responsible for:

[2] Table 3, National Bureau of Standards Handbook, No. 52.

(a) Insuring that all persons working with radiation equipment or materials are properly and adequately instructed in the use of all necessary safeguards and procedures and are supplied with such auxiliary safety devices as may be indicated. This shall also apply to visitors to areas under his cognizance.

(b) Insuring by means of radiation surveys that any space normally occupied by persons not primarily engaged in radiation or associated work is not subjected to radiation levels which would result in a person receiving a dose exceeding one-tenth the maximum permissible amounts indicated in Regulations 4 (b) and 4 (c) of this chapter.

(c) Controlling the discharge of radioactive wastes so that any population group or any person or persons outside the installation is not subjected to radiation levels exceeding one-tenth the maximum permissible levels specified in Regulation 4 (c) of this chapter.

REGULATION 6. PERSONNEL PROTECTION. It shall be the duty of the owner or operator of a radiation installation to instruct all persons whose duties include the operation of radiation equipment or the handling of radioactive materials, and all other persons who may regularly enter a radiation installation, in the hazards associated with, and the safe methods of operation and use of the radiation equipment or the use of radioactive materials.

The owner or operator of a radiation installation shall provide personnel monitoring equipment, properly calibrated, for each and every individual for whom there is any reasonable possibility of receiving a routine weekly exposure of all radiations in excess of one-fourth the maximum permissible amounts specified in Regulation 4 of this chapter. All persons required to wear personnel monitoring equipment shall be instructed in its proper use and purpose. Records shall be kept of all such exposures and shall be permanently [3] filed by the owner or operator in the office of the establishment owning or operating the radiation installation. These records shall be open to inspection by a duly authorized representative of the health department. Individual exposure records shall be considered a part of the personnel file of the individual. Such individual, on his request, shall be supplied with a summary statement of his radiation exposure record.

Personnel monitoring equipment shall be worn on the thorax. If it is determined that the head and neck or extremities will or many receive exposures greater than one-fourth the maximum permissible amounts specified for these organs, personnel monitoring equipment shall be worn also on the extremity likely to be so exposed.

Protective equipment, without defects, such as leaded rubber aprons and leaded rubber gloves, shall be available to and used by the operator of fluoroscopic equipment.

When it is known or believed that the exposure of an individual during any one week or fraction thereof may have exceeded five times the maximum permissible total weekly amounts specified in Regulation 4 (b) (1) through 4 (b) (9) of this chapter, all facts relative to its ocurrence and sequela shall be reported in detail to the State Department of Health within 72 hours of the discovery thereof and a copy of the report included in the individual's personnel file. Immediate corrective measures leading to the elimination of the recurrence or continuance of the overexposure shall be undertaken by the person in charge.

REGULATION 7. MEDICAL EXAMINATIONS. All operators of radiation equipment and persons handling radioactive material or other persons, who regularly or frequently may be subjected to a weekly exposure of all radiations in excess of one-fourth the maximum permissible amounts, as specified in Regulation 4 of this chapter, shall be examined for radiation injury by a physician once each year. Such examinations shall include, whenever medically indicated, pertinent laboratory examinations such as blood counts, urinalysis, expired air analysis, or other laboratory tests or aids which will give data of value bearing on the state of health of the individual. Records shall be kept of such examinations and shall be permanently [4] filed by the owner or operator in the office of the establishment

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[3] The term "permanently" as used in this regulation shall mean any of the following:
(1) for the length of the employment of the individual plus five years,
(2) until two years following the death of the individual,
(3) until, upon application, specific instructions, in writing, have been given by the State Commissioner of Health for the disposition of records.

[4] The term "permanently" as used in this regulation shall mean any of the following:
(1) for the length of the employment of the individual plus five years,
(2) until two years following the death of the individual,
(3) until, upon application, specific instructions, in writing, have been given by the State Commissioner of Health for the disposition of records.

owning or operating the radiation installation and shall be open to inspection by a duly authorized representative of the Department of Health.

REGULATION 8. PROTECTION OF PATIENT. In the use of X-ray in the medical arts, protection of the patient from serious overdosage should be maintained while obtaining diagnostic objectives. The following table is inserted as a guide to indicate the dosage rates to be expected in the radiographic voltage range.

TABLE 3.—*Approximate air-dosage rates (Roentgens per 100 milliampere seconds) for pulsating potential with a 1.0 millimeter aluminum filter added*

Target-skin distance		Kilovolts						
		50	60	70	80	90	100	125
⊖m	in.							
30	11.8	3.6	5.4	7.5	9.7	13.0	15.0	22.0
45.7	18	1.6	2.4	3.2	4.2	5.5	6.4	9.6
50	19.7	1.3	2.0	2.7	3.5	4.6	5.3	8.0
61	24	.9	1.4	1.9	2.3	3.1	3.6	5.4
91.5	36	.4	.6	.8	1.0	1.4	1.6	2.4
100	39.4	.3	.5	.7	.9	1.1	1.3	2.0
183	72	.1	.15	.2	.25	.35	.4	.6

Fluoroscopic work should be performed in the minimum time possible and the lowest X-ray intensity and smallest aperture consistent with clinical requirements should be used. Flouroscopists should completely dark-adapt their eyes before starting examinations.

Proper filters shall be provided for all X-ray equipment and all filters should have their thickness clearly marked on them.

No fluoroscopy equipment shall be operated unless an automatic timer is installed so set and functioning as to interrupt the X-ray exposure at the end of two minutes' total exposure. Such timer shall be so installed that the equipment may not be reactivated without resetting the controls.

Focal-skin distance for all fluoroscopes shall not be less than twelve inches. X-ray output at table top should not be more than 12 roentgens per minute from medium voltage setting and 4 milliamp X-ray tube current.

REGULATION 9. DISPOSAL OF RADIOACTIVE WASTES. Radioactive wastes shall not be allowed to accumulate in an amount sufficient to constitute a hazard to the persons in the vicinity. Such wastes shall be disposed of in such manner so that the radioactivity discharged in combination with that discharged by other users will not cause concentrations of radioactive material in the environment that may result in a person or persons receiving a radiation dose exceeding that specified in Regulation 4 (d) of this chapter.

Radioactive wastes shall not be disposed of by burial in the soil except under the specific approval, in writing, of the State Commissioner of Health. Controlled subsurface storage in such a fashion that radioactive material cannot mix with the soil or enter the ground water shall not be considered disposal by burial.

Radioactive wastes shall not be disposed of by dumping on the surface of the ground except under the specific approval, in writing, of the State Commissioner of Health. Controlled surface storage in such a fashion that radioactive material cannot mix with the soil or enter the ground water shall not be considered disposal by dumping.

REGULATION 10. HOSPITALIZATION OF PATIENTS RECEIVING RADIOISOTOPES. All patients receiving doses of radioisotopes such that the radioisotope content of the body will exceed 30 millicuries shall be hospitalized until the radioisotope content of the body is less than 30 millicuries.

REGULATION 11.[5] HANDLING OF CADAVERS CONTAINING RADIOISOTOPES. The identification of a particular patient as radioactive shall be the responsibility of the physician in charge of the case. If such a patient dies in a hospital, the doctor who pronounces him dead shall notify the physician in charge of the case at once.

If at the time of death, the body of the patient contains more than five millicuries of radioactive Iodine or radioactive gold, and an autopsy is to be performed, a statement of dose and date of its administration shall be entered at once on a

[5] As a general guide to compliance with Regulation 11, the recommendations of the National Committee on Radiation Protection, as published in Handbook 56 of the National Bureau of Standards may be followed.

tag, by the physician in charge of the case or his designated representative and attached to the body. No autopsy should be commenced on a body that contains more than five millicuries of radioactivity without the consultation and advice of the radiation safety officer[6] of the hospital.

A radioactivity report shall be completed by the radiation safety officer and shall accompany the body when it is surrendered to the funeral director. This form shall contain the following information:

(a) Name of hospital.

(b) Name of deceased.

(c) A statement, "This certifies that the remains of _____ have been examined this date by the Radiation Safety Officer or his deputy. Radioactivity close to the surface of the body, as determined by _____
(State instrument or method)
(is) (is not) below the rate of 30 mr/hr that is acceptable for embalmers during their work. The maximum permissible dose rate will not be exceeded provided rubber gloves are worn, and further precautions are observed as listed below."

(d) Statement of precautions to be taken.

(e) Date.

(f) Signature of Radiation Safety Officer.

REGULATION 12. MONITORING OF RADIATION INSTALLATIONS. It shall be the responsibility of the owner or operator of a radiation installation to make or cause to have made by a competent person with appropriate monitoring equipment, surveys of the radiation installation at the intervals outlined below to determine whether any person might be subjected to ionizing radiation in quantities which would result in such person receiving a total weekly radiation dose in excess of the maximum permissible limits established in Regulation 4 of this chapter.

Records shall be made of such surveys and shall be permanently[7] filed by the owner or operator in the office of the establishment owning or operating the radiation installations. Such records shall be open to inspection by a duly authorized representative of the Department of Health. The owner or operator shall take such steps as are necessary to keep the radiation intensity in any occupied space below the rate which would result in a person receiving a radiation dose exceeding the maximum permissible total weekly dose during the time the space is occupied by that person during any week.

(a) Radiation installations in which radioactive materials, not contained in a sealed source, are used or handled shall be surveyed at least once a month. Such surveys shall be made more often if required by the State Department of Health, or if it is indicated by personnel monitoring equipment or other means that more frequent surveys are necessary to maintain radiation intensities below the satisfactory maximum. Continuous radiation monitoring of the air in or about an area where radioactive materials are present shall be required if there is any reasonable possibility that the levels of activity in the air may exceed the amounts specified in Regulation 4 (c) of this chapter.

(b) Radiation installations in which radiation equipment is used, or where radioactive materials contained in a sealed source are used or handled, shall be surveyed for radiation intensities when installed and thereafter whenever any change is made in the installation of its use which would affect its protective features. When such equipment or installations are subject to vibrations or other physical conditions which may cause changes in the protective features, inspection of protective devices and surveys for radiation intensities shall be made at least once every six months or at more frequent intervals if required by the State Department of Health.

REGULATION 13. X-RAY THERAPY ROOMS. No person other than the patient and those who may be required to hold the patient, shall be allowed to remain within an X-ray therapy room in which equipment is installed which can be operated at a potential above 150 kilovolts while the equipment producing ionized radiation is in operation. No members of the radiological staff nor other persons normally near X-ray equipment shall hold a patient during irradiation. The person holding the patient shall not be in the useful beam and shall be protected as much as practical from scattered radiation.

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[6] An official radiation safety officer is required by the Isotopes Division of the Atomic Energy Commission in institutions equipped for treatment with radioisotopes.

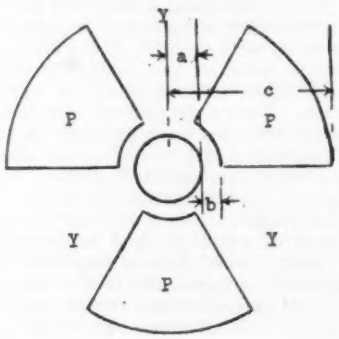
[7] The term "permanently" as used in this regulation shall mean either of the following:
(1) for 5 years following the date of the survey.
(2) until, upon application, specific instructions, in writing, have been given by the State Commissioner of Health for the disposition of such records.

Every entrance to an X-ray therapy room in which equipment is operated at a potential above 150 kilovolts shall be provided with a door equipped with electrical interlocks so arranged that no person can enter the enclosure without interrupting the electric power supplying the equipment producing the ionizing radiation. The electrical circuit shall be so arranged that following interruption, the equipment cannot be reactivated without resetting the controls. Visible or audible signals, or both, shall be installed in addition to the electrically interlocked door. Such signals for the enclosure shall be arranged so as to be activated at the same time or before the radiation producing equipment is operated. All doors shall be provided with devices so that no person can be locked within the enclosure.

REGULATION 14. WARNING SIGNS OR SIGNALS. All locations where ionizing radiation may be encountered in hazardous amounts shall be marked or posted with warning signs, signals, or lights. The standard radioactive warning symbol and color, as generally employed by users of radioactivity in this country, shall be used in warning signs.

Standard radioactivity warning symbol

DANGER



Y - Yellow
P - Purple

RADIATION HAZARD

Recommended Proportions:

a/b approximately 2/1
a/c approximately 1/5

Color

The American Standard Safety Color Code Z53.1 - 1953

Purple Ideal Munsell Notation for Chromaticity - 1.3 RP 4.2/14.5 - ISCC - NBS "Vivid reddish purple"

Yellow Ideal Munsell Notation for Chromaticity 5.3 Y 8/12 - ISCC - NBS "Vivid yellow"

A colored circle centered in a sectored outer circular design of alternate 60° divisions. Center circle and three outer segments colored in purple with yellow background. Lettering in black or purple.

The sign shall indicate the contents or source or radiation, the words "Caution" or "Danger," as applicable, and the precautionary measures which are applicable; such as—"X-ray! Do not loiter!"

All material and equipment producing ionizing radiation shall be clearly labeled with the radioactive warning symbol and signs as follows:

(a) *X-ray producing equipment:* "CAUTION—X-RAYS"

"This equipment produces X-rays when energized."

(b) *Radioactive material* (sealed sources of external hazard only): "CAUTION—RADIATION"

Where a time limit is specified, it should be posted.

(c) *Radioactive material* (in loose bulk or unsealed containers—internal hazards primarily): "DANGER—RADIATION"

"The material contained herein should not be taken internally either by inhalation, ingestion, or through wounds in the skin."

REGULATION 15. ACCOUNTING FOR RADIOACTIVE MATERIAL. An accurate accounting for all radioactive materials shall be maintained in a radiation installation. Such records shall show radioactive materials received, the amounts and form of the radioactive material, purpose for which used, amounts of wastes and such other information as may be necessary to account for the difference between the amount of activity received and the amount on hand. Such records shall be open to inspection on request by the State Commissioner of Health or his authorized representative.

REGULATION 16. RADIATION ILLNESS, INJURIES, EMERGENCIES, ACCIDENTS. Accidents involving the serious overexposure of personnel, the discharge of radioactive wastes in a concentration above the acceptable limit, the spillage, loss or theft of radium, or other radioactive materials, fire, flood, or other catastrophe affecting places using radioactive materials, or other incidents which will or are likely to expose people to hazardous quantities of radiation, whether it occurs at an installation as defined in this chapter or in any other place, shall be reported immediately by the person in charge by telephone or telegraph to the district State health officer, the county commissioner of health, or the city commissioner of health having jurisdiction. Following the receipt of such notification, the health officer having jurisdiction shall investigate the incident promptly and institute all necessary protective and preventive measures. He shall advise the person making the report and any other local health officers of the action taken or proposed to be taken for the protection of the public or people concerned.

For the purpose of this regulation, "the serious overexposure of personnel" shall mean the exposure of a person or persons to a quantity of external radiation exceeding that specified in regulation 4 (b) (10) and 4 (b) (12) of this chapter, or to a quantity of internal exposure which would result from the ingestion or inhalation of radioactive material in such quantities as to exceed 10 times the maximum permissible amount of radioisotope in total body. (Handbook 52, National Bureau of Standards.) Therapeutic treatment of a patient by a physician shall not come within the intent of this regulation.

For the purpose of this regulation, "acceptable limit" shall mean that concentration of radioactive material which will not constitute a hazardous external exposure to a person or persons nor a hazardous internal exposure at the point of consumption.

It shall be the duty of every physician, the manager, superintendent, or person in charge of every hospital, institution, or dispensary to report in writing to the State Department of Health the full name, address, and age of every patient, occupant, or inmate thereof or person treated therein who may be suffering from radiation illness or injury from exposure to ionizing radiation.

REGULATION 17. APPROVED EQUIPMENT. All x-ray equipment installed in a radiation installation after July 1, 1955, shall, where applicable, bear the seal of approval of the Underwriters' Laboratories, Inc. All equipment installed prior to July 1, 1955, if not bearing such seal, shall be altered to comply with the pertinent requirements of the standard of the National Board of Fire Underwriters.[8]

REGULATION 18. VACATED PREMISES. It shall be the responsibility of the operator of any radiation installation, upon vacating, or the owner or lessor, before reoccupation, to carry out any necessary decontamination of the premises. The owner, lessor, or agent shall be responsible for notifying any future occupants, if radiation hazards or potential hazards remain.

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[8] The National Electrical Code is the standard of the National Board of Fire Underwriters.

REGULATION 19. SHOE-FITTING FLUOROSCOPES. (a) No person, firm, or corporation shall own or operate fluoroscopic or x-ray equipment for fitting shoes unless the equipment is permanently equipped with an automatic timer so set and functioning as to cut off each x-ray exposure at the end of a five-second interval.

(b) All establishments which own or use such a shoe-fitting fluoroscope shall display at all times, in a location where all users can see it, a customer warning sign furnished by the State Department of Health.

(c) Exposure to the useful beam measured on the base of the foot opening by fluoroscopic shoe-fitting machines installed after July 1, 1955, shall not exceed 1.0 roentgen per viewing.

Exposure to the useful beam measured on the base of the foot opening of fluoroscopic shoe-fitting machines installed prior to July 1, 1955, shall not exceed two roentgens per viewing. After January 1, 1960, no shoe-fitting fluoroscopic machine shall be operated if the exposure to the useful beam measured at the base of the foot opening exceeds 1.0 roentgen per viewing.

(d) The floor of the foot opening shall be covered with a sheet of aluminum at least 1 mm. thick and of dimensions equal to or greater than the floor. This aluminum filter shall be protected from wear by a covering layer of other material and shall be installed in such a fashion that its thickness can be conveniently determined.

(e) Only sales persons shall be permitted to operate shoe-fitting fluoroscope devices. The starting mechanism shall be so designed and located as to prevent operation by customers.

(f) The fluoroscent viewing screen shall be covered with leaded glass having a lead equivalent of at least 1.5 mm. for a 65-kilovolt peak.

(g) Customers shall be required to have shoes on both feet during a fluoroscopic examination.

(h) Customers should be questioned regarding dates and numbers of previous shoe-fitting examinations and may not be allowed such fittings in excess of 12 per year or in excess of three per day.

(i) Salespersons shall operate the device for their own customers only.

(j) The operator shall not use his own feet or hands for demonstrating X-ray fluoroscopy. Children's feet shall not be held in position by any person while the machine is in operation.

(k) Operators shall report any defects in the machine to the person in charge of the premises wherein such machine is installed. Defective machines shall not be operated until repairs are made.

(l) Machines shall be located as far as possible from frequently occupied areas. X-ray tubes shall be so shielded and cabinets so constructed that stray radiation is reduced to less than 10 milliroentgens per hour at all positions within six inches of the cabinet and at viewing ports at eye level, except at the foot opening. Foot openings shall be so oriented and shielded that scattered radiation from the openings is not directed toward occupied areas or mirrors unless suitable protecting screens are interposed. Scatter radiation from the foot opening shall not exceed a rate of 10 milliroentgens per hour at a distance of ten feet.

(m) All metal non-current carrying parts shall be properly grounded.

(n) An interlocking switch shall be provided on any door or panel giving access to high voltage components. This switch shall operate to break the electrical current whenever the door or panel is opened.

(o) Cabinet doors or panels shall be kept locked at all times except when making necessary repairs.

AMERICAN MACHINE & FOUNDRY CO.,
Washington, D. C., March 11, 1955.

Hon. CLINTON P. ANDERSON,
Chairman, Joint Committee on Atomic Energy,
United States Senate, Washington 25, D. C.

DEAR MR. CHAIRMAN: We wish to thank you for your invitation to present to your committee our observations on the development of the atomic-energy industry. These observations are based primarily on our experiences in the establishment of an atomic-energy program within the American Machine & Foundry Co.

Basically, we view with optimism the industrial development of atomic-energy applications. We are certain that these applications will lead to new products

and processes which will have a profound and beneficial effect on our life and times. In addition, we feel that the investment by industry in money and in scientific and engineering talent on atomic-energy projects will substantially strengthen the atomic-energy capabilities of our Nation as a whole.

In presenting our observations there are several points we wish to make in connection with the current efforts and interests of industry in the atomic-energy field. It has been stated in some quarters that industry is reluctant to expend large amounts of money on atomic-energy developments in spite of the encouragement given to it by the Congress and the Atomic Energy Commission. We do not believe this is so. The development of any new industry follows a familiar pattern of a slow but gradually increasing buildup of effort and investment eventually leading to substantial and continuing industrial activity. Industrial atomic-energy efforts are still in the initial stages of development and are, by and large, being given close and serious consideration by company managements. We are encouraged rather than discouraged by the extent of the interest and investment made by industry in atomic-energy developments during the past year and a half and, particularly, during the past 6 months. Regarding industry's basic interests in the atomic-energy field, it has been said that industry is attempting to exploit, unfairly, the many billions of dollars' worth of information developed under the United States atomic-energy program during the past 13 years. It is our observation that in most areas of atomic-energy activity, the interest on the part of industry does not stem from a prospect of getting rich quickly. Rather it stems from a genuine concern over the possible effect of atomic-energy developments on present products and processes and from a genuine interest in investigating new fields for the development of new products and processes, looking toward future returns for its efforts. In either case, industry will invest its money and talents, in ascertaining the real value of atomic-energy developments, to an extent commensurate with incentives and freedom from severe restrictions. We feel confident that fair and reasonable incentives as well as workable procedures will be established through appropriate actions by your committee, the Congress, and the Atomic Energy Commission.

We appreciate and are fully aware of the broad steps already taken to encourage the private development of atomic energy. The Atomic Energy Act of 1954 has opened the door for private enterprise to take a direct and responsible part in the development of atomic energy for industrial purposes. The act has provided also for the downgrading of nonweapons information and we understand that the Atomic Energy Commission is establishing a basis for implementing this provision of the act to make essential technical information accessible to institutions and industrial companies which will put it to good and effective use. The Atomic Energy Commission is also establishing procedures for carrying out the licensing provisions of the new act which should clarify the qualms felt by some quarters in industry of whether the rapid and widespread development of atomic-energy applications will be too severely restricted by controls under the Atomic Energy Act. All in all, we feel that great strides have been taken by our Government in encouraging industrial participation in the atomic-energy field. We feel, also, that further steps should be taken in several areas which loom up as possible obstacles to the fullest development of atomic energy. Principal among these are the areas of patents and insurance. Regarding patents, our patent office has participated in the meetings of the National Association of Manufacturers on this subject. We endorse the views submitted to your committee by the National Association of Manufacturers and we will not repeat them here. Regarding insurance, we feel that work outside of the large-scale reactor field will be adequately covered by insurance contracts with private companies, so that a large area of industrial development can proceed without serious handicap due to excessive insurance premiums, since the risk in this area is already almost negligible. The problem of insuring against the extremely remote but not entirely negligible possibility of a nuclear accident in a large-scale power reactor is presently a serious one which requires further consideration by both industry and the Government for its solution.

During the past few years we believe that American Machine & Foundry Co. has enjoyed a reasonably successful development of its atomic-energy program. We testified before the Joint Committee in July 1953 that we were interested in participating in the atomic-energy field and that we were willing to spend company time and money in so doing. Prior to establishing our atomic-energy program, we gave careful consideration to the particular capabilities of American Machine & Foundry Co. and to the company's long-range objectives in developing

new fields of interests. Since July 1953 we have made substantial expenditures for a company of our size and we believe that we have achieved some notable accomplishments. In the atomic-energy-applications field we have developed the use of beta gages for the control of cigarette manufacture and now provide these gages as standard equipment for our cigarette machines. Through our association with the bakery and agricultural industries, we are also undertaking work on the application of radiation to the preservation and storage of bulk grains and other food products. In the research-reactor field we have developed a standardized research reactor for use at universities and industrial laboratories. We are building one of these reactors under contract with the Battelle Memorial Institute and are quoting fixed prices for these facilities to others. In the package-reactor field we have worked on the development of various approaches to packaged power for use by the Government and by industry at locations which today make such use economical. In the reactor-equipment field, we have made long strides in the standardization of reactor components in the interest of reducing costs and establishing safe standards for the design of these important parts of reactor systems. More recently we have initiated a program for the construction of a research reactor in the New York area to be owned and operated by a number of industrial companies for the purpose of undertaking private research and development work making use of neutrons and gamma radiations. We feel that this step is a most effective one in bringing industry into the atomic-energy field.

In all of our work we have received the encouragement and support of the Atomic Energy Commission. We recognize that some of the procedures in dealing with the broad ramifications of the program are slow and cumbersome, but we do not feel they have represented serious obstacles to our progress. With the effort being made by your committee and the Atomic Energy Commission, we look forward to continued and growing development of atomic-energy applications by industry.

I venture to take this opportunity to congratulate the committee on its work, and to offer any further assistance of which we may be capable.

With kindest personal regards, I am,

Very sincerely,

WALTER B. SMITH, *Vice Chairman.*

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